

Integrated Environment, Safety, & Health Management Plan

Integrated Safety Management (ISM) System



July 2013


Revision 8



Lawrence Berkeley National Laboratory

Integrated Safety* Management provides important opportunities and advantages for the Lawrence Berkeley National Laboratory and the Department of Energy in the consistent and proper attention to safety¹ and environmental protection essential in the conduct of the Laboratory's missions. This document describes a forward-looking and comprehensive institutional approach and set of requirements for operations and activities, and for the implementation of the Integrated Safety Management System. A high level of attention to environmental protection, safety, health, and performance is of prime importance to the success of the Laboratory and the Department of Energy.

Approved:

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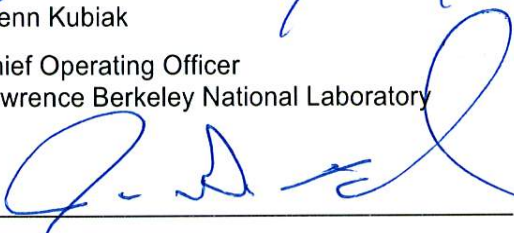
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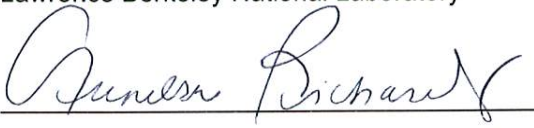
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*** Whenever Safety is discussed, the following applies:**

DOE Policy 450.4 Safety Management System Policy "...the term safety is used synonymously with environment, safety and health (ES&H) to encompass protection of the public, the workers, and the environment." Clause I.074 of Contract 31 expands the definition of safety by "including pollution prevention and waste minimization." This footnote indicates that this text is from DOE P 450.4, in which Safety is the original wording and is to mean ES&H.

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NOTICE

This LBNL *Integrated Safety Management System (ISMS) Management Plan* is available on the LBNL Web site at the following location:

<http://www.lbl.gov/lab-index/i-master-ism.html>

Record of Revisions

Revision No.	Date	Description
1	1/1998	Original Document
2	10/2001	Minor update
3	5/2004	Minor update
4	9/2005	Minor update.
5	9/2005	Minor update.
6	9/2007	This revision is a significant rewrite of prior revisions. It realigns the described roles and responsibilities with current LBNL operating practices and organizational structure. Revision 6 addresses the issues brought forward in the 2006 Peer and ISM Evaluation Reviews, and takes into account the many changes to worker safety and health program elements placed into PUB-3000 during the implementation of the 10CFR851 Worker Safety and Health Program. It also weaves the Environmental Management System back into the fabric of the overall ES&H program described in the ISMS Management Plan, rather than patching it on top of the Plan. This document is reorganized to follow the basic structure of DOE P 450.4 Safety Management System Policy, and to provide a clear overview of how LBNL manages its ES&H responsibilities. It provides a strengthened foundation for future, continuous improvement.
7	10/2009	<p>This revision continues the updates made in Revision 6. The fundamental changes are:</p> <ul style="list-style-type: none"> • The Work Smart Standards process is succeeded by the ES&H Standards process. • The Safety Review Committee is replaced by the Safety Advisory Committee. • The Division ISM Plan template is replaced by a checklist. • Division Safety Committee discussion is moved from the appendix to the body of the document. • Discussions of Requirements Management, Program Development and Implementation, and Conduct of Operations are added. • The institutional ISM Improvement Project Plan and process are introduced. • Updates that further integrate the LBNL Environmental Management System in accordance with DOE Order 450.1A,

		<i>Environmental Protection Program.</i>
7.1	4/2010	Added Section 6.2.1.2 2 to recognize organizational deficiencies and “no blame culture.
8	7/2013	<p>This revision continues the updates made in Revision 6. The fundamental changes are:</p> <ul style="list-style-type: none">• The RPM Requirements Management Process supersedes the ES&H Standards process, deleting Appendix C.• The RPM HR Employee Performance Evaluation document and process supersedes the Appendix B Employee and Staff Safety Performance Appraisal Implementation Policy and Plan, which is deleted.• The updated term “ES&H Manual” replaces references to PUB-3000 in most instances.• ES&H organizational structure discussion is revised to address changes• Verbiage is aligned with revisions to ES&H policy statements in the ES&H RPM and Manual as part of the 2012 Requirements Management Project.• Record of Revision table added.

Executive Summary

Introduction

The Lawrence Berkeley National Laboratory (LBNL) takes a comprehensive institutional approach to its Integrated Safety Management System (ISMS). This *Integrated Environment, Health, & Safety Management Plan (Management Plan)* articulates the institutional requirements for all operations on the main site, and at any other sites where Laboratory staff, affiliates, and subcontractors work. This *Management Plan* stipulates the requirements for the *LBNL Environment, Safety and Health Manual (ES&H Manual, PUB-3000)* requirement for division-specific documents, and explains the safety and environmental management system mechanisms and a work-planning and authorization process. The *Management Plan* is based upon the Laboratory's contract with the Department of Energy (DOE), the Environment, Safety, and Health (ES&H) Standards, and LBNL ES&H policy stated in the *Requirements and Policy Manual (RPM)*. This Plan addresses the ES&H Standards Set and their incorporation into Laboratory operations. In particular, it includes restatements, clarifications, and new statements of institutional requirements for LBNL operations.

This *Management Plan* is intended for use by the LBNL workforce and is available for those in the University of California (UC) and DOE organizations who review operations, verify compliance, and approve modifications.

Background

LBNL is a government-owned, contractor-operated, multiprogram research and development facility. UC manages and operates LBNL under Prime Contract DE-AC02-05CH11231 for DOE (Contract 31). Contract 31 defines the principles, working relationships, and contractual and legal requirements under which the Laboratory must operate.

The institutional ISMS requirements result from careful examination by LBNL of its approach to safety and the environment. They follow the guidance from DOE Headquarters and the DOE Berkeley Site Office (BSO). They are consistent with Contract 31's requirements and adhere to the ISMS structure described by DOE. The requirements have been refined through an interactive process involving the Laboratory Director, Deputy Director, and all division directors (including selected members of their management, supervisory, and operational staffs).

Policy and Commitment

Berkeley Lab policy requires all work to be performed safely with full regard to the well-being of workers, affiliates, the public, and the environment.

Keys to implementing this policy are the following core safety values:

- The institution demonstrates a strong commitment to safety by integrating safety into all facets of its work.
- Managers, supervisors, and work leads are actively involved and demonstrate leadership in performing work safely.
- Individuals take ownership for safety and continuously strive to improve.
- Individuals demonstrate an awareness and concern for the safety of others and strive to prevent harm to other workers, the general public, and the environment.

The Laboratory is committed to doing this while meeting the requirements of Clause I.86 of Contract 31 and implementing the policy provided in DOE P 450.4 (*Safety Management System Policy*) and the specifications and guidance for putting into place an Environmental Management System (DOE Order 450.1A, *Environmental Protection Program*).¹

The Laboratory affirms that it:

- 1) Understands and supports the Contract 31 requirement for an ISMS at LBNL and the Contract's opportunities and values;
- 2) Adopts DOE's Integrated Safety Management (ISM) Objective, Guiding Principles, and Core Functions, and the institutional requirements in this LBNL ISMS *Management Plan* document;
- 3) Commits to implementing and using ISMS in all its programs, operations, facilities, and activities;
- 4) Provides responsible occupational safety, health, and environmental (including energy and water use) stewardship in its strategic planning, decision-making processes, and the management of its work activities through the ISMS.

ISMS Management Plan Fundamentals

This *Management Plan* identifies the core requirements that provide the foundation for the integrated safety and environmental management system approach to ES&H management at LBNL. These requirements implement DOE's seven Guiding Principles and five Core Functions.

DOE's Seven Guiding Principles

- 1) Line Management Responsibility for Safety
- 2) Clear Roles and Responsibilities
- 3) Competence Commensurate with Responsibilities
- 4) Balanced Priorities

- 5) Identification of ES&H Standards and Requirements
- 6) Hazard Controls (including environmental controls) Tailored to Work Being Performed
- 7) Operations Authorization

DOE's Five Core Functions

- 1) Define the Scope of Work
- 2) Analyze the Hazards (including environmental impacts).
- 3) Develop and Implement Hazard Controls (including environmental controls)
- 4) Perform Work within Controls
- 5) Provide Feedback and Continuous Improvement

Philosophy

The LBNL overall ES&H philosophy is as follows:

- 1) In the context of carrying out the Laboratory's technical missions, ES&H policies and programs are the most important day-to-day consideration given the emphasis on doing good science.
- 2) Accidents are preventable by each individual and the responsible organizations paying close attention to potential hazards and taking appropriate action.
- 3) Responsible stewardship of environmental resources is an integral part of ES&H management, and results in the reduction of environmental impacts locally, regionally, and globally
- 4) The Laboratory recognizes that humans are fallible and that everyone makes errors. The most common causes of human error are weaknesses in the organization, not lack of skill or knowledge. When events occur, management's first reaction should be to look within the organization rather than to blame an individual.
- 5) Managers, supervisors, safety line managers, and work leads are responsible for ensuring that an adequate system is in place to carry out work safely and in an environmentally responsible manner. An identifiable line management chain is ultimately responsible for each work activity.
- 6) Each supervisor and safety line manager is expected to ensure that all individuals reporting to him or her understand the ES&H expectations, governing work controls, and the means by which they can safely and successfully perform their assignments while providing responsible stewardship of the environmental resources in their care.

- 7) Each individual is directly responsible for ensuring his or her own safety and environmental stewardship, looking out for fellow workers, and promoting a safe, healthful, and environmentally sound workplace and community. Individuals may participate in setting policy, establishing coordinating processes, and in assessing and improving activities. All individuals are to follow ES&H-related work instructions. If the work instructions cannot be followed safely or present a new hazard, the employee is responsible for notifying the appropriate individuals and assisting, as appropriate, in modifying the work instructions.
- 8) Employees, contractors, and affiliates are held accountable for their performance with respect to ES&H policies and principles.

Management Chain. Managers are individuals responsible for formulating and administering policies and programs of the Laboratory; collectively, they are the line management. Typically, this includes some level of responsibility for staffing, performance review, work direction and evaluation, and finance. The formal “chain of command” management structure at LBNL starts at the top with the Laboratory Director, and ends with supervisors, safety line managers, or work leads. Examples include but are not limited to program heads, group leaders, department heads, division deputies, superintendents, administrators, supervisors, and work leads.

A matrix supervisor is responsible for providing day-to-day technical direction and oversight, including responsibilities for proper execution of ES&H activities of employees and guests in the work area of another division. The matrix supervisor is the safety line manager for the specified work area and acts on behalf of the division for guests and visitors at the Laboratory. A matrix supervisor partners with the home supervisor on matters of staffing, performance review, work direction, and/or evaluation.

Subcontractors. LBNL’s commitment to safety, the environment, and ISM is formally extended to subcontractors and subcontract employees for whom LBNL has ES&H responsibility. All subcontracts will incorporate ES&H requirements, which will then flow down to lower-tier subcontractors, as appropriate.

Graded Approach and Tailoring. ISMS at LBNL provides for a graded approach (i.e., different levels of rigor and formality) when applying controls commensurate with the hazards and environmental impacts involved. To complement this, tailored controls address the hazards and environmental impacts, satisfy the applicable requirements, and provide adequate protection to the public, workers, and the environment.

Work Planning and Authorization. Work is planned, reviewed, and authorized before the activity begins. An appropriate work review is conducted to validate satisfaction of the ES&H requirements. Once the work begins, it is appropriately controlled (workers are responsible for adhering to the ES&H controls; safety line managers and work leads ensure that workers understand the ES&H controls and understand that work is to be performed according to the defined work controls). Safety line managers and work leads make sure workers have access to and knowledge about an activity's governing procedures and work controls.

Feedback and Improvement. Work activities are monitored to ensure the governing procedures and ES&H documents are being followed. Safety line managers and work leads observe their workers at appropriate intervals to verify that work is performed according to the defined ES&H work controls. Workers are to tell their safety line manager, or work lead, of ES&H problems or opportunities for improvement. A worker can stop work if there is an unsafe or unapproved condition. Each division develops and operates an ES&H self-assessment program to guarantee a proactive approach to ES&H and to improve ES&H performance. Also, divisions are responsible for root-cause analysis and correction of ES&H-related problems. Lessons Learned are to be shared to enhance operational ES&H and facilitate cost effectiveness.

Integration. The integration of program and ES&H planning, from the Laboratory Director down to individual workers, is attentive to the Institution/Facility/Activity Process. Worker involvement is critical to ISM. Thus, an important integration direction is a formalized upward involvement of workers as well as from the top down through the Institution/Facility/Activity Process. At the same time, the *ES&H Manual* and the incorporation of its ISMS fundamentals are basic to Laboratory integration and operations. In this context, all work activities are to be performed according to the provisions of the *ES&H Manual*, with the assistance of Environment, Health, and Safety (EHS) Division subject matter experts, division liaisons, and the division safety coordinators. Horizontal integration across the divisions is accomplished through many established groups.

Division Plans and Documents. Because each division has unique programmatic missions coupled with different types of facilities, technical work, hazards, and environmental impacts, the division is responsible for managing how ISM is implemented within its organization. This *Management Plan* specifies those actions that a division must perform. The division-specific approach shall be consistent with this *Management Plan* and PUB-3000 and documented in division-specific ISM *Implementation Plans*. Guidance for the development of these plans is found in Section 6.0 and 8.2 of this *Management Plan*.

ES&H Manual. To be in line with the increased formalization brought about by ISM, the Laboratory has assembled broadly used institutional ES&H documents into a formal document structure called the *LBNL Environment, Safety and Health Manual* (*ES&H Manual*, PUB-3000). This comprehensive manual consolidates many documents into one convenient online package. LBNL performs work to meet the *ES&H Manual* requirements, which are based on

the ES&H Standards Set identified for specific Laboratory work and associated hazards and environmental impacts. With the implementation of ISM, employees must understand the latest ES&H requirements and their responsibilities.

Communications and Training. The implementation of an effective ISMS requires a comprehensive communications program that includes training all workers. Laboratory-wide communications and tailored training to support the ISM rollout started in 1999, and continue today. Communication goals include creating ISM awareness and sensitizing employees to environment, safety, and health issues. The intent is for ES&H issues to be a routine part of all Laboratory communications. With the enhancements of the integration of the Environmental Management System into ISMS, additional awareness and responsibility training has been incorporated into the continuing ISMS training.

Standards and Requirements. Contract 31 stands as the fundamental basis for Laboratory operations. It provides the legal foundation for all activities. Clause I.86 of Contract 31 is the foundation of ISM and is consistent with DOE Policy 450.4.

ES&H Standards. Clause I.79 of Contract 31 contains the language providing for ES&H Standards. These Standards establish workplace ES&H controls and are an integral part of ISM. DOE, UC, and LBNL collaborated in a Necessary & Sufficient (N&S) Process to tailor an ES&H Standards Set for LBNL.

Maintenance of the ES&H Standards Set. The Standards can be modified to meet the Laboratory's changing needs. A formal Change Management Process, using the N&S Process, provides an opportunity to keep the ES&H Standards Set up to date.

Flow-Down of Requirements. LBNL operations are addressed through ES&H management processes found in RPM, Environment, Safety and Health section and controls noted in the *ES&H Manual*. These and other institution-level documents include formal processes for applying requirements locally at the facility and activity levels. A key to the flow-down process is the formal incorporation of the ES&H Standards Set into , the *ES&H Manual*.

Overview of Revision 8. The current revision (Revision 8) continues the updates made in Revision 6. The fundamental changes are:

- The RPM Requirements Management Process supersedes the ES&H Standards process, deleting Appendix C.
- The RPM HR Employee Performance Evaluation document supersedes the Appendix B
- The updated term "ES&H Manual" replaces references to PUB-3000 in most instances.
- ES&H organizational structure discussion is revised to address changes
- Verbiage is aligned with revisions to ES&H policy statements in the ES&H RPM and Manual as part of the 2012 Requirements Management Project.

1.0 Background

1.1 LBNL Description

Lawrence Berkeley National Laboratory (LBNL) is a government-owned, contractor-operated research and development facility managed and operated by the University of California (UC) for the Department of Energy (DOE) under Prime Contract DE-AC02-05CH11231 (Contract 31).² Contract 31 defines the principles, working relationships, and contractual and legal requirements under which the Laboratory must operate and is held accountable.

The work at LBNL focuses primarily on energy and the environment, biosciences and biotechnology, and fundamental science and applied technology.

Since its inception, the Laboratory's location on the hillside above UC Berkeley has offered a unique opportunity for scientific and academic partnerships, and has helped to foster the academic excellence that is the hallmark of the Laboratory's scientific endeavors. Of the Laboratory's staff of approximately 4,500, more than 250 faculty/scientists hold joint appointments with UC Berkeley and other UC campuses. In addition, nearly 800 students and postdoctoral fellows are employed each year, along with more than 3,000 participating guests from institutions around the world.

In addition to its fundamental research, Berkeley Lab's research centers and user facilities provide intellectual resources, services, infrastructure, and unique experimental facilities not found anywhere else in the world, including the Advanced Light Source, the National Energy Research Scientific Computing Center, the Energy Sciences Network, the Molecular Foundry, the National Center for Electron Microscopy, and the Joint Genome Institute.

As of May 2013, LBNL work is conducted primarily at the following LBNL locations:

- The LBNL main site
- Donner Laboratory on the UC Berkeley main campus
- The Joint Genome Institute (JGI) in Walnut Creek
- Berkeley Biosciences West (Potter Street) in Berkeley
- The National Energy Research Scientific Computing Center (NERSC) in downtown Oakland
- The Joint BioEnergy Institute (JBEI) in Emeryville
- Other spaces leased for LBNL (e.g., CFO in Emeryville, CA)

1.2 ISMS Development Overview

The creation and development of Integrated Safety Management (ISM) in DOE Office of Science operations has evolved over time. The Price-Anderson Amendments Act in 1988 is

seen as a start in ISM. The DOE initiation of the Necessary & Sufficient Standards concept in 1995, which became the Work Smart Standards, continued that process and was superseded by the ES&H Standards process in 2008. The DOE *Safety Management System Policy*, DOE P 450.4,³ of Oct. 15, 1996, presented the structure to “provide a formal, organized process whereby people plan, perform, assess, and improve the safe conduct of work.” It was “institutionalized through DOE directives and contracts to establish the Department-wide ES&H management objective, Guiding Principles, and Functions.”^{4,5} The applicable Department of Energy Acquisition Regulation (DEAR) amendment followed in 1997, and Clause I.86, *Integration of Environment, Safety, and Health into Planning and Execution*, became part of the UC DOE contract for LBNL on June 1, 2005, as a means of integrating the Environmental Management System into the *ES&H Management Plan*.

This *Management Plan* articulates the institutional requirements for all LBNL operations and provides definition and elaboration of the critical aspects for the understanding and successful implementation of the ISMS.

2.0 Purpose

This LBNL *Integrated Safety Management System Plan* (ISMS, or *Management Plan*) provides a formally approved institutional structure for ISM developed by LBNL that "...systematically integrates safety into management and work practices at all levels, so that missions are accomplished efficiently while protecting the workers, the public, and the environment." It contains the LBNL institutional approach for the incorporation and implementation of the DOE *Integrated Safety Management Policy*, DOE P 450.4A, using written guidance and continued detailed interaction and coordination from DOE Office of Science (DOE SC) and DOE Headquarters.

It links the ES&H Standards Set to Laboratory operations by providing direction, guidance, and appropriate safety behaviors needed to conduct all activities and operations in compliance with the ES&H Standards Set. With final approval by DOE SC Berkeley Site Office, this *Management Plan* establishes the agreement on the content and processes for ISM implementation and continued use at LBNL.

This *Management Plan* describes the hierarchy of documentation, organization, and commitment for the implementation and continuance of the LBNL ISMS. It starts with Contract 31 and the ES&H standards and is formally implemented through the on-line [Requirements and Policies Manual](#) (RPM, PUB-201). Requirements are listed in this *Management Plan* and flow down through the LBNL [Environment, Safety & Health Manual](#) (PUB-3000), and division-specific documentation to address their particular operations, activities, hazards, and environmental impacts. Key features in the ISM are the use of the graded approach and the concept of "tailoring commensurate with the hazards and environmental impacts," which is critical for practical and affordable implementation. Worker involvement is also important and is actively sought out throughout the work review, authorization, and execution process. The hierarchy of these documents is displayed in Figure 2.1, from the [ES&H Core Policy](#).

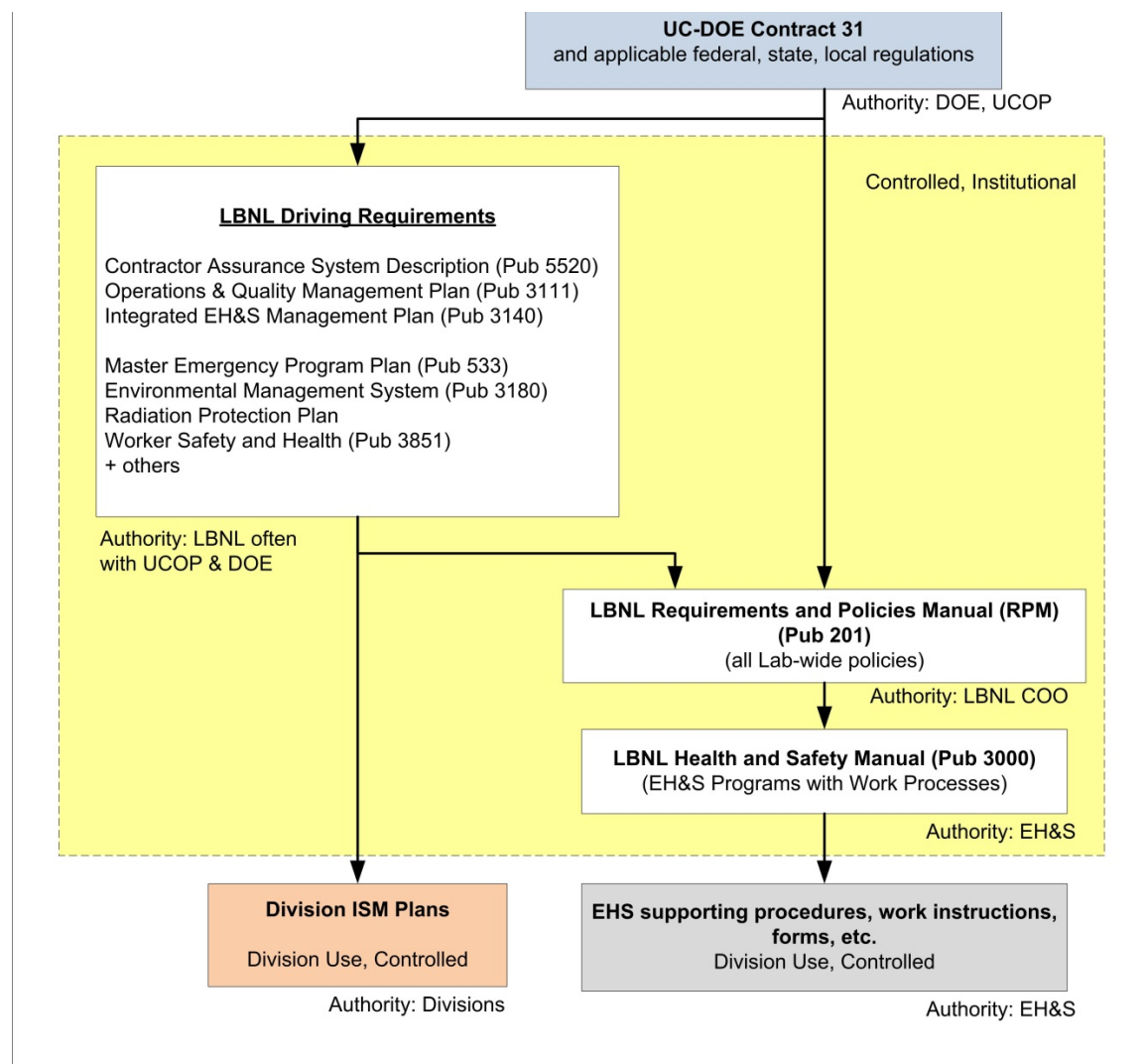


Figure 2.1 LBNL Document Hierarchy: Functional relationship between the DOE contract and ES&H Standards and the LBNL ES&H policy and implementing elements.

The most significant documents in this context are listed below, with their URLs.

LBNL/PUB-201, *Requirements and Policy Manual (RPM)*:

<http://www.lbl.gov/Workplace/RPM/>

LBNL/PUB-3140, *Integrated Environment, Health, & Safety Management Plan*:

LBNL/PUB-3000, *Environment, Safety and Health Manual*:

<http://www.lbl.gov/ehs/pub3000>

LBNL *ES&H Standards Set*:

http://labs.ucop.edu/labprimecontracts/LBNL/esh_std_lbnl.pdf

LBNL/PUB-3851, *Worker Safety and Health Program*:

<http://www.lbl.gov/ehs/safety/assets/docs/LBNL-PUB-3851.pdf>

LBNL/PUB-3180, *Environmental Management System Plan*:

http://www.lbl.gov/ehs/esg/EMS%20Plan/assets/EMS%20Plan_0309.pdf

LBNL/RPP, LBNL *Radiation Protection Program*: PUB-3000 Chapter 21

<http://www.lbl.gov/ehs/pub3000/CH21.html>

LBNL/PUB-5341, *Chemical Hygiene and Safety Plan*:

<http://www.lbl.gov/ehs/chsp/index.shtml>

LBNL/PUB-3435E, *Biological Safety Program Manual*:

http://www.lbl.gov/ehs/biosafety/Biosafety_Manual/biosafety_manual.shtml

LBNL/PUB-3111, *Operating and Quality Management Plan*:

<http://www.lbl.gov/DIR/OIA/assets/docs/OCA/About%20OCA/Operating%20and%20Quality%20Management%20Plan%20Signed.pdf>

LBNL/PUB-3092, *Guidelines for Generators to Meet Hazardous Waste Handling Facility Acceptance Requirements*:

http://www.lbl.gov/ehs/waste/wm_pub_3092.shtml

[LBNL/PUB-533, Master Emergency Plan](#)

<http://www.lbl.gov/ehs/ep/>

This *Management Plan* contains the institutional requirements for all ES&H activities at LBNL. Considerations for the ES&H Standards Set that were approved and incorporated into the

Contract are included. The development, approval, and delivery of this updated *Management Plan* satisfies a key requirement of Clause I.86 of Contract 31, effective June 1, 2005.

This *Management Plan* is intended for use by the entire LBNL workforce, including subcontractors. Similarly, it is available to those in the University of California and DOE organizations with ISM, ES&H, oversight, and Contract responsibilities.

3.0 SCOPE

This *Management Plan* applies to the work authorized under Contract 31, which, in addition to Research and Development, includes administrative and operational support functions such as business operations, facility construction and maintenance, and security and emergency response activities. LBNL and DOE may mutually agree to develop additional authorization agreements for specific facilities or activities. All facilities and activities at LBNL not specifically operating under an authorization agreement, or a separately approved *Integrated Safety Management System (ISMS) Management Plan*, are authorized when following this *Management Plan* using the procedures described in *ES&H Manual* Chapters 1, 6, 10, 31 and 32.

This *Management Plan* presents the institutional requirements and major methods for the implementation of ISMS into all operations and activities at LBNL. It is based on the provisions of Contract 31 and the requirements of the ES&H Standards Set.

LBNL accomplishes its institutional role in the DOE ISM Institution/Facility/Activity Process by a combination of Laboratory-wide or infrastructure functions, and division or operating-unit functions. The Laboratory-wide functions are those that affect all LBNL operations and employees. The divisions participate by administering the program funding, managing the people, operating the facilities, and conducting the activities. The word “institution” is used instead of “site” or “site-wide” because many LBNL activities also occur off the main site and all LBNL activities must be covered by the ISMS.

At LBNL, facilities are defined as portions of buildings, individual buildings, or groups of buildings that fulfill a specific purpose. A building manager is appointed for each facility by the responsible division director and is readily identifiable and available (e.g., name and contact information is posted). For the areas between buildings, the responsible organization is the Facilities Division. In situations where programmatic activities are outdoors, the cognizant program division has the responsibility for the local area involved. Building manager responsibilities are described in PUB-541, Building Manager Policy and Procedures.

Many LBNL personnel are assigned to or interact with a wide variety of outside organizations including other DOE sites, the U.S. Department of Health and Human Services, the Department of Defense, and other governmental agencies, as well as overseas organizations in various action and inspection capacities. This results in heavy travel traffic, with its own safety hazards and environmental impacts, during the course of Laboratory business. LBNL personnel in these situations have had training in the LBNL ISMS, both institutional and from their divisions, and are expected to appropriately use the process in the conduct of their official activities and assignments. Those at other DOE sites—e.g., DOE Headquarters, Brookhaven National Laboratory (BNL), Argonne National Laboratory—either visiting or on assignment, are expected to work according to the ISMS and any accompanying agreement structures with the organizations operating at those sites. The *Division Implementation Plans* and any succeeding documentation provide the specifics for their off-site personnel and connections.

For work carried out in LBNL and UC Berkeley spaces, a “Partnership Agreement” has been renewed that clarifies responsibilities and oversight of safety and environmental requirements. Although the Berkeley campus and Berkeley Laboratory safety systems and procedures differ, they are consistent with the principles of integrated safety management and provide equivalent protection.⁶ This is discussed further in Section 5.8.

The Laboratory will periodically review this *Management Plan* and make feedback and improvement changes as described in Section 8.4. The initial review will occur at or about the anniversary date of its DOE Office of Science, Berkeley Site Office approval. This review provides a process to evaluate what is working and what needs improvement, and to address any new initiatives and proposals. It permits a comprehensive maintenance of the *Management Plan* and the opportunity to keep it current. This review goes beyond the action-oriented type of changes that are most likely in the ongoing ES&H Standards Requirements Management Process. The LBNL EH&S Division *ES&H Manual* Manager is responsible for posting the currently approved ISMS *Management Plan* to the EHS Web site.

4.0 ISMS System Overview

4.1 Introduction to the Integrated Safety Management System (ISMS)

ISMS is the means by which ES&H requirements are integrated into the planning and execution of work. It consists of two related components: organizational structure (arrangements of people) and underlying principles and operations (functions or processes). DOE and its contractors must systematically integrate ES&H into management and work practices at all levels, from work planning to execution. In summary, the overall management of ES&H functions and activities becomes an integral part of mission accomplishment.

DOE has defined seven Guiding Principles that are the fundamental policies for DOE and its contractors to use in the management of ES&H. They are:

- 1) Line Management Responsibility for Safety
- 2) Clear Roles and Responsibilities
- 3) Competence Commensurate with Responsibilities
- 4) Balanced Priorities
- 5) Identification of ES&H Standards and Requirements
- 6) Hazard Controls (including environmental controls) Tailored to Work Being Performed
- 7) Operations Authorization

DOE has defined five Core Functions for integrated ES&H management that make up the underlying process for any work activity that could affect the public, the workers, and the environment.

- 1) Define the Scope of Work. Missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.
- 2) Analyze the Hazards. Hazards and environmental impacts associated with the work are identified, analyzed, and categorized.
- 3) Develop and Implement Hazard Controls (including environmental controls). Applicable standards and requirements are identified and agreed upon, controls are established to prevent and/or mitigate hazards, environmental impacts are identified and evaluated for reduction, the ES&H envelope is established, and controls are implemented.
- 4) Perform Work within Controls. Readiness is confirmed and work is performed within the ES&H envelope established.
- 5) Provide Feedback and Continuous Improvement. Feedback information on the adequacy of controls is gathered, the efficiency of reducing environmental impacts is researched,

opportunities for improving the definition and planning of work are identified and implemented, line and independent oversight are conducted, and, if necessary, regulatory enforcement actions occur.

These five Core Functions are applied as a continuous cycle with the degree of rigor appropriate to address the type of work activity and the hazards and/or environmental impacts involved. The ISM Work Cycle, as displayed in Figure 4.1, shows the continuous relationship of the functions.

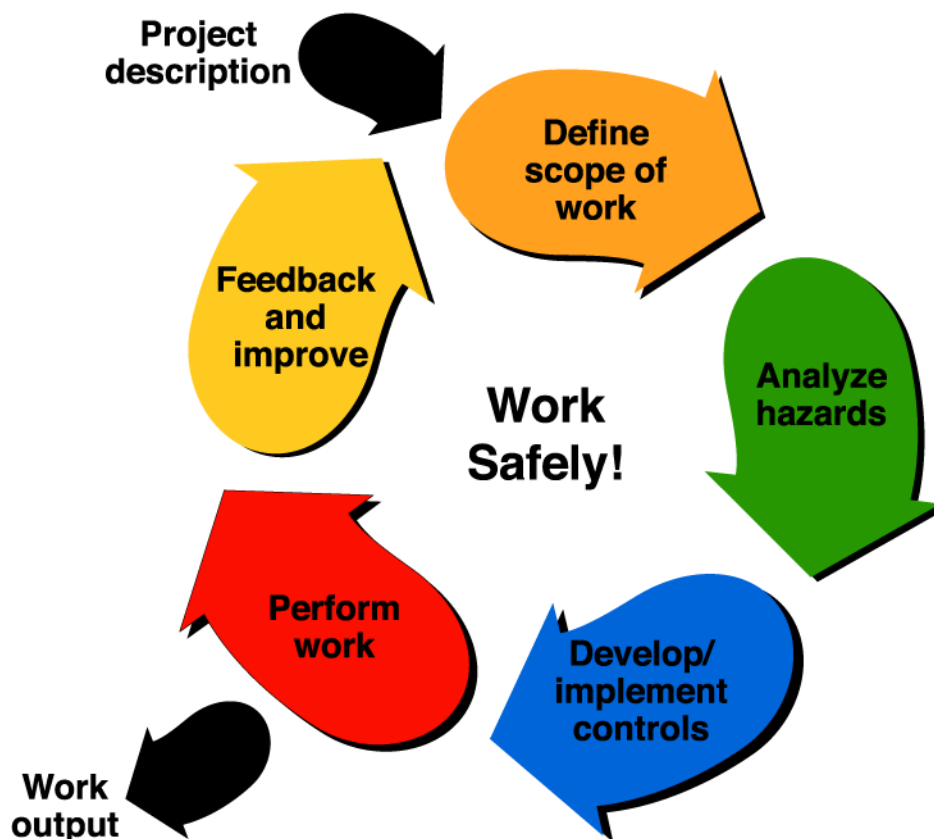


Figure 4.1 Basic ISM Work Cycle

Environmental concerns are included in the ES&H *Management Plan* at each step of the ISM Work Cycle. However, as mandated by and in conformance with DOE Order 450.1A, *Environmental Protection Program*, the Laboratory has developed the LBNL Environmental Management System DOE Guidance¹ assists with defining how the two systems integrate with each other.

4.1.1 Implementation

Implementation of the ISM Work Cycle takes place at multiple organizational levels, including the institutional level, the division or facility level, the activity level, and the individual level. The Laboratory's ISMS and Environmental Management System (EMS) functions performed at the institutional level are to: (1) clarify missions; (2) establish ES&H policies, objectives, and

expectations; (3) select a tailored set of ES&H standards; (4) generate and authorize use of the *ES&H Manual* and other direction and guidance; and (5) assess overall system performance. Much of the information produced at the institutional level is used to set expectations that ES&H functions are performed during programmatic and institutional work at the facility and activity levels.

To benefit from both locally developed processes and controls and institutional consistency, the Laboratory uses the DOE Guiding Principles, Core Functions and EMS principles in managing division and activity work planning and execution while retaining a required level of institutional uniformity through a set of division-level ISM implementation plans. Doing so results in practices and controls tailored to both activity-level and division or facility-specific management needs, and meets uniform expectations at the institutional level.

At the division or facility level, this *Management Plan* ensures safe and environmentally responsible operations of the facility's infrastructure and activities. This means that the DOE Guiding Principles, Core Functions and the EMS principles of this *Management Plan* are followed not only in operating the facility, but also in ensuring the activities performed in that facility are within the facility's ES&H envelope and are compatible with one another. For this reason, facility-management concurrence is required before activities can start within the facility.

Although the Laboratory's ISMS activity-level functions involve many of the same positions and organizations as those at the institutional level, the information generated and shared is different. At the activity level, management is concerned about such items as technical approaches; reaching specific work objectives; resources and schedules; hazards and environmental impacts analysis associated with the specific work; acceptable controls for protection; hardware, facilities, methods, environment, and staff; and authorization to proceed.

4.1.2 Improvement

Organizational structure, functions, and information sharing are all necessary for the successful management of ES&H integration. LBNL, UC, and DOE Berkeley Site Office develop annual objective measures that gauge the Laboratory's management system performance (*Performance Evaluation and Measurement Plan*). Mutually developed ES&H performance measures are important gauges of *Management Plan* effectiveness. In addition, objectives and targets are established by LBNL to reduce the impacts of the Laboratory's significant environmental impacts. Plans are developed and put into place to continuously improve LBNL's environmental performance. Results are measured and reported annually to the senior Laboratory management and DOE.

4.2 LBNL ES&H Policy Statement

Berkeley Lab policy requires all work to be performed safely with full regard to the well-being of workers, affiliates, the public, and the environment.

Keys to implementing this policy are the following core safety values:

- The institution demonstrates a strong commitment to safety by integrating safety into all facets of its work.
- Managers, supervisors and work leads are actively involved and demonstrate leadership in performing work safely.
- Individuals take ownership for safety and continuously strive to improve.
- Individuals demonstrate an awareness and concern for the safety of others and strive to prevent harm to other workers, the general public, and the environment.

4.3 Philosophy

LBNL's overall ES&H philosophy is as follows:

- 1) In the context of carrying out the Laboratory's technical missions, ES&H policies and programs are the most important day-to-day consideration given the emphasis on doing good science.
- 2) Accidents are preventable by each individual and responsible organization paying close attention to potential hazards and taking appropriate action.
- 3) Responsible stewardship of environmental resources is an integral part ES&H management, and results in the reduction of environmental impacts locally, regionally, and globally.
- 4) The Laboratory recognizes that humans are fallible and that everyone makes errors. The most common causes of human error are weaknesses in the organization, not lack of skill or knowledge. When events occur, management's first reaction should be to look within the organization rather than to blame an individual.
- 5) Managers, supervisors, safety line managers, and work leads are responsible for ensuring that an adequate system is in place to carry out work safely while also being environmentally responsible. An identifiable line-management chain is ultimately responsible for each work activity.
- 6) Each supervisor and safety line manager is expected to ensure that all individuals reporting to him or her understand the ES&H expectations, governing work controls, and the means by which they can safely and successfully perform their assignments while providing stewardship of the environmental resources in their care.
- 7) Each individual is directly responsible for ensuring his or her own safety and environmental stewardship, looking out for fellow workers, and promoting a safe, healthful, and environmentally sound workplace and community. Individuals may participate in setting policy, establishing coordinating processes, and in assessing and improving activities. All individuals must follow ES&H-related work instructions. If the work instructions cannot be followed safely or present a new hazard, the employee is responsible for notifying the appropriate individuals and assisting, as appropriate, in modifying the work instructions.

- 8) Employees, contractors, and affiliates are held accountable for their performance with respect to ES&H policies and principles.

4.4 Overarching ISMS Responsibilities

It is each individual's responsibility to: (1) understand the Laboratory's ES&H policy and to participate in its pursuit; (2) determine in concert with others the best way to achieve ES&H goals in conformance with Laboratory requirements and to participate in the development of Laboratory policy and procedures in a constructive manner; (3) use appropriate available resources; and (4) ask for any help necessary to ensure a safe work environment and to reduce environmental impact, while performing a broad set of job responsibilities and pursuing all technical, administrative, or craft objectives.

Managers, supervisors, and work leads must specify the technical, administrative, craft, and ES&H goals; assign specific responsibilities; appropriately define and manage ES&H issues; provide the necessary resources to accomplish the objectives; ensure compliance; monitor, measure, and evaluate performance against targets, where applicable; modify and improve upon processes as necessary; and reward each individual appropriately.

To achieve the ES&H goal, work at LBNL will be done using the *ES&H Manual* with the direct assistance and support of the EH&S Division subject matter experts and the division liaisons.

Divisions must ensure that work is performed consistent with the requirements and expectations specified in this institutional *Management Plan*. The authorizing organization (i.e., the division director) is responsible for authorizing specific work activities. Authorizing organizations are distinguished by having control of the funding. Organizations authorizing work and the associated management chain are responsible for ensuring that all work in their purview is conducted safely while providing responsible stewardship of the environmental resources in their care. Individuals must follow ES&H safe work instructions, including signage, Job Hazard Analysis (JHA) requirements, and work procedures.

4.5 Institution and Division ISMS Interface

This *Management Plan* defines the ISM core philosophy, requirements, and parameters for the LBNL workforce and work environment. The requirements established in this *Management Plan* serve as the basis for the ES&H Core Policy in the RPM, Chapter 1 (*General ES&H Requirements, Responsibilities and Work Practices*) in the *ES&H Manual* and the division ISM *Implementation Plans*. In turn, these documents detail the Laboratory's ES&H policies, practices, and individual responsibilities. The ES&H Standards Set in Contract 31 is the currently applicable set of ES&H standards, and serves as the basis for the *ES&H Manual*.

All LBNL work activities must be performed in conformance with the provisions of the *ES&H Manual*, the EMS Plan, and the division ISM *Implementation Plans* with the assistance of ES&H subject matter experts. Individuals are responsible for following all ES&H-related work

instructions. If the work instructions cannot be followed safely as presented, or if they present a new hazard, the employee is responsible for notifying the appropriate individuals and assisting, as appropriate, in modifying the work instructions. Because of the significant differences in the nature of operations across the Laboratory, each division director has the responsibility for ensuring that organizational missions are carried out in conformance with the philosophy, parameters, and requirements defined in this *Management Plan* and the *ES&H Manual*. To facilitate this outcome, each division director has the responsibility for ensuring that ISM requirements are implemented within his or her division. Division-specific ISMS *Implementation Plans* must be used for this purpose. A checklist for division ISMS *Implementation Plans* is found in Appendix A. Annual reviews of each division's ISMS *Implementation Plan* are undertaken by the EH&S Division to ensure continued adherence of each division's operations to the philosophy, requirements, and parameters established in this institutional ISM *Plan*.

4.6 Structure for ES&H Management in LBNL Operations

The division directors have the direct responsibility and authority for authorizing and oversight of the Laboratory's programmatic work, and primary responsibility for applying and fulfilling the Laboratory's ES&H policies in the performance of that work. Division directors must be aware of statutory, regulatory, and contractual ES&H requirements applicable to their operations and facilities. In meeting their obligations, each division director can simultaneously function in one or more of four operational functions: program division director, home/payroll division director, facility division director, and services division director. Authorities for the different operational functions vary, but the program division director has the primary responsibility. For many mission projects, the program division director is also the home/payroll, facility, and services division director.

Division directors have safety coordinators and Safety Advisory Committee (SAC) members on their staffs, as well as a Division Safety Committee to support the division's ES&H activities. The LBNL SAC is a council composed of representatives from each of the divisions, and provides high-level counsel to the Laboratory Director and Chief Operating Officer on ES&H policies. The EH&S Division assigns liaisons to each Directorate and a Health and Safety Representative for each division and the Director's Office. In addition, experts from outside the Laboratory can be called in when needed. Roles and responsibilities of EH&S Division liaisons, division safety coordinators, and the SAC are provided in Sections 5.3.8, 5.4, and 5.5 of this document, and are expanded upon in *ES&H Manual*, Chapter 1.

4.7 ISMS Development and Continuous Improvement Process

4.7.1 ISMS Preparation

The initial LBNL ISMS *Management Plan* was developed, verified, and authorized in 1999 after significant foundational work was completed. The initial ES&H Standards list was developed and added to the DOE contract. Each work activity was identified and evaluated for hazards as part of the initial Integrated Hazard Assessment (IHA) with an accompanying IHA database. The

hazards were cataloged and ranked in another database that has become the current Corrective Action Tracking System (CATS).

The underlying processes associated with the hazard- and impact-analysis elements of ISMS have matured. The initial IHA database was superseded by the Hazards, Equipment, and Authorizations Review (HEAR) system and subsequently by the LBNL Hazard Management System (HMS). This Web-based tool allows division users direct access to information relevant to the identification and evaluation of hazards associated with their operations. The emphasis is on division-user maintenance and use of the data. The Job Hazard Questionnaire (JHQ) evolved into the Job Hazard Analysis (JHA) process. Every worker must have a current Individual Baseline JHA authorizing regular and routine work that may be performed.

Revision 6 of the ISMS *Management Plan* was a significant revision of the prior versions. It realigned the described roles and responsibilities to the current LBNL operating practices and organizational structure. The revision addressed the issues brought forward in the 2006 Peer and ISM Evaluation Reviews. It took into account the many changes to worker safety and health program elements placed into the *ES&H Manual* during the implementation of the 10CFR851 *Worker Safety and Health Program* rule. It also wove the EMS back into the fabric of the overall ES&H program described in the ISMS *Management Plan*, rather than patching it on top of the Plan. This document was reorganized to follow the basic structure of DOE P 450.4 *Safety Management System Policy* outline, and to provide a clear overview of how LBNL manages its ES&H responsibilities. It provided a strengthened foundation for future continuous improvement.

The current revision (Revision 8) continues the updates made in Revision 6. The fundamental changes are:

- The RPM Requirements Management Process supersedes the ES&H Standards process.
- The updated term “ES&H Manual” replaces references to PUB-3000 in most instances.
- ES&H organizational structure discussion is revised to address changes
- Verbiage is aligned with revisions to ES&H policy statements in the ES&H RPM and Manual as part of the 2012 Requirements Management Project.

4.7.2 Future Evaluations of the ISMS

As management and organizational changes take place at the Laboratory, any new divisions will need to perform reviews to evaluate their compliance status with this *Management Plan*, and develop their division-specific documents with the associated division gap analysis. The Plan will be reviewed and appropriate revisions will be made on an annual basis as described in Section 8.4.

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5.0 Environment, Safety, Health, and Assurance Organization Responsibilities, Services, and Interfaces

5.1 Introduction

This *Management Plan* addresses all aspects of the ES&H program in the Integrated Safety Management System (ISMS) at LBNL; however, the interfaces among specific environment, safety, and health organizations deserve additional attention. This section addresses the Laboratory's Environment/Health/Safety/(EHS) Division's charter, organization, and administrative responsibilities and authorities. It also describes the EHS Division's relationships with other LBNL organizations that participate in the overall ES&H process, including the UC Berkeley campus. It should be noted that DOE addresses the subject area of Environment, Safety, and Health as "ES&H." It should be distinguished from the LBNL division name of the EHS Division.

5.2 Environment, Health, Safety, Division (EHS Division)

5.2.1 EHS Division Charter

The Environment, Health, Safety (EHS) Division is chartered with the mission of helping Berkeley Lab achieve its commitment to perform all work safely and in a manner that strives for the highest degree of protection for employees, participating affiliates, visitors, subcontractors, the public, and the environment. The official charter is posted in the RPM and is summarized below.

- EHS strives to keep the Berkeley Lab community and environment safe and secure as the frontiers of science are explored. The Division partners with scientists and stakeholders to maintain a high level of safety consciousness and performance by providing cost-effective advice, processes, and tools.
- EHS supports and acts as a partner with line management as the Division meets direct responsibilities to ensure that protection of workers, the public, and the environment is integrated into the primary research and support functions of each Laboratory division or unit.
- Of equal importance, EHS supports and provides expertise directly to each Laboratory worker who seeks Environment, Safety & Health (ES&H) advice and help, or who voices a concern.

In carrying out its Charter, EHS Division is committed to six basic objectives:

- Provide employees with a safe workplace.
- Design and operate facilities and research activities to minimize adverse impact on public health and the environment.

- Produce and use materials that can be disposed of safely and that will minimize waste.
- Promptly communicate to affected persons the known hazards of our activities and the related methods necessary for safety and health protection.
- Use available technology, engineered safeguards, and responsible science to mitigate all significant risks arising from its research and related activities.
- Train and develop staff to meet the commitments to a safe workplace, and minimize adverse impact on public health and the environment.

5.2.2 EHS Division Organization and Administrative Responsibilities and Authority

The EHS Division is organized into three functional units.

- Technical Program Management
- Client Support Services
- EHS Operations

The Technical Program Management unit consists of the Employee Health & Safety Department; the Environment, Waste, and Radiation Protection Department; and the Technical Support Services Group that reports to the Technical Program Management Deputy Division Director. Employee Health & Safety has four groups: Occupational Safety, Industrial Hygiene, Health Services, and Construction Projects and Field Support. Environment, Waste, and Radiation Protection has three groups: Environmental Services, Radiation Protection, and Waste Management.

The Client Support Services unit reports to the Deputy Director for Client Support Services and consists of Associate Laboratory Director Liaison Support, Incident Investigations, Assurance Management/Occurrence Reporting Processing System, EHS Customer Service, EHS Training, and Communications.

EHS Operations reports to the Deputy Director for Business Services and includes Business Services, EHS IT Systems, Site Access Foreign Visits & Assignments, and Strategic Planning & Project Management.

Group leaders must manage their organizations, and are responsible for planning, staffing, and budgeting, as well as developing and implementing Laboratory policies and procedures in their functional areas. The EHS Division Director, deputy division directors, and department heads represent the EHS Division when communicating with internal and external organizations and individuals on matters of significance to the success of the Laboratory.

Each Associate Laboratory Directorate organization has a designated EHS Division liaison who serves as a point of contact between a customer division (typically via a division safety coordinator) and the EHS Division through the Associate Laboratory Directorate/Division Support Group in the Client Support Services unit. EHS liaisons function as troubleshooters, facilitators, and problem solvers. They provide technical consultation and responsive customer service, partnering with customers to implement cost-effective injury and illness prevention/loss control programs, assist line management with division Integrated Safety Management (ISM) plans, and provide ongoing support to customer division management.

Information regarding the EHS Division points of contact, policies and procedures, and other ES&H-related information is maintained on the EHS Division Web site at:

<http://www.lbl.gov/ehs/>

5.3 Protective Services Department

The Protective Services Department, consists of Security, Emergency Management, and Fire Protection Services. It was established as an independent department reporting to the Chief Operating Officer in 2013, and includes the laboratory Fire Department, which is contracted to Alameda County. The department is established to better integrate management of the Lab's fire protection, security and emergency management programs, and to adopt best practices commonly employed in other national labs, industry and municipalities. It is responsible for the Lab's [Master Emergency Plan \(PUB-533\)](#). [Its programs are implemented through the ES&H Manual and Requirements and Policy Manual \(RPM\) in accordance with the Requirements Management Policy](#)

Information regarding the Protective Services Department points of contact, policies and procedures, and other related information is maintained on the department web site at:

<http://www.lbl.gov/ehs/ppls/>

5.4 Division Safety Coordinators

Division safety coordinators (DSCs) report directly to their division directors or deputies. The DSC is responsible for administering the division's ES&H program. Their duties include supporting division line managers or work leads in the execution of their safety responsibilities. They help integrate safety into all work activities and promote a safety culture where everyone takes responsibility for personal safety and looks out for the safety of others. They serve as a point of contact for all division staff regarding the implementation and interpretation of ES&H policies, procedures, and programs. They serve as a member of their division safety committee

(or equivalent organization). They are typically responsible for maintenance of their division's *ISM Implementation Plan*.

The complete list of the duties, roles, and responsibilities of DSCs is available in the *ES&H Manual*—ES&H General Requirements (Section 1.E, *Division Safety Coordinators*).

5.5 Safety Advisory Committee

The Safety Advisory Committee (SAC) makes recommendations to the EHS Division Director on the development and implementation of Environment, Safety, and Health (ES&H) policy, guidelines, codes, and regulatory interpretation. It conducts reviews of special safety problems, and provides recommendations for possible solutions to the Laboratory Director, Associate Laboratory Director for Operations (ALDO)/Chief Operating Officer (COO), and/or the EH&S Division Director, as requested. The SAC also provides advice and counsel to the ALDO/COO by reviewing appeals from Laboratory divisions when any division and the EHS Division do not agree on the interpretation or application of criteria, rules, or procedures. Such advice and counsel may include options for a resolution.

In addition, the SAC Chair, in cooperation with the Office of Contract Assurance, is responsible for scheduling and conducting the portion of institutional self-assessment known as ES&H Peer Reviews. These reviews are designed to ensure management systems consistent with Integrated Safety Management (ISM) are in place in all Laboratory divisions and that these systems are leading to the effective implementation of the Laboratory's ES&H program. Peer reviews are normally conducted triennially by each Laboratory division and a SAC subcommittee. Depending on the Peer review results and a Laboratory division's response to them, the SAC will have the option to recommend changing the interval of the next review by one year. All members of the SAC are expected to serve on Peer subcommittees. Peer review results will be submitted directly to the Laboratory Director.

The SAC Chair may appoint expert subcommittees to address specific health and safety matters. Such subcommittees may become long-standing expert subcommittees, or they may be of short duration, depending upon the technical support requirement.

The duties, roles, and responsibilities of the SAC are delineated *the ES&H Manual*—ES&H General Requirements, (Section 1.E, *Safety Advisory Committee*). Their activities are described in detail on their Web site:

<http://www.lbl.gov/ehs/sac/index.shtml>

5.6 Radiation Safety Committee

The LBNL Radiation Safety Committee (RSC) is appointed by, and reports to, the Laboratory Director and is responsible for advising LBNL management on all matters related to occupational and environmental radiation safety. The RSC reviews and recommends approval of radiation safety policies and guides the EH&S Division and radiation user divisions in carrying out these programs. The scope of its actions generally is in issues of broad institutional concern and impact, or areas of potential high consequence either in terms of safety or institutional needs.

The RSC provides a forum to ensure that important radiation safety issues receive appropriate, balanced, and expert review before being acted upon.

The RSC is composed of not more than 10 nor fewer than five members exclusive of ex-officio members. Members are appointed by the Laboratory Director for three-year renewable terms on the basis of knowledge of the principles and practices of the control of radiation hazards and on experience and management in the use of radioisotopes and/or radiation-producing machines. The membership reflects the diversity of scientific disciplines using radiation at LBNL. The LBNL Radiological Control Manager (RCM) serves as a full member and acts as the liaison with other Berkeley Lab programs. In addition, the LBNL SAC provides at least one full or ex-officio member who provides liaison to that body to ensure integration with larger institutional safety issues.

The duties, roles, and responsibilities of the RSC are delineated in detail on their Web site:

<http://ehswprod.lbl.gov/rpg/charter.shtml>

5.7 Institutional Biosafety Committee

The Laboratory requires maintenance of a qualified Institutional Biosafety Committee (IBC) to perform key biosafety functions as required by and in accordance with this charter and the NIH, CDC, DOE, and LBNL standards.

The IBC is responsible for oversight, administration, and review of Berkeley Laboratory policies and projects involving research with biological materials that may pose safety, health, or environmental risks. The IBC reports to the Laboratory Director to provide institutional assurance that research is conducted safely. To this end, the IBC assists and advises researchers and line managers in meeting their responsibilities to ensure that the biological aspects of the research are conducted in a safe manner using established biosafety standards, principles and functions of ISM, and work authorization (e.g., *EH&S Manual*, Chapter 6). Safe research includes worker safety, public health, agricultural and environmental protection, ethics, and compliance with applicable biosafety standards and LBNL policies. A graded process is used to define, document, review, and approve biological work and controls as detailed in *EH&S*

Manual,--Biosafety Policy. This process involves IBC approval and line management authorization of biological work.

The duties, roles, and responsibilities of the IBC are delineated in *EH&S Manual*,--Biosafety Policy, Section 26.4.2 *Institutional Biosafety Committee* and Chapter 26, Appendix C. Their activities are described in detail on their Web site:

<http://www.lbl.gov/ehs/biosafety/bioSafetyCommittee.pdf>

5.8 Environmental Management System Implementation (Core) Team

The EMS Core Team designs, implements, and maintains an EMS to help control environmental compliance concerns and to develop environmental programs to assure that adequate operational controls are in place that provide continual improvement in the reduction of environmental impacts and promotion of environmental stewardship. The EMS Program Manager convenes meetings; leads the team through design, implementation, and ongoing use of EMS; and serves as the main liaison between the EMS Core Team and LBNL executive management. The EMS Core Team meets regularly to:

- Provide Core Team training on EMS-related activities;
- Identify environmental impacts;
- Determine which environmental impacts;
- Discuss objectives and targets;
- Monitor progress toward improving environmental performance;
- Review Environmental Management Programs, which are specific programs intended to reduce activities with significant environmental impacts;
- Review findings from assessments, audits, and reviews and determine appropriate corrective actions;
- Work together—the EMS Program Manager and Core Team members—to support executive management in the Management Review process and to keep executive management apprised of:
 - New issues or changes in the Environmental Management Programs;
 - Changes in operational controls needed to implement new issues or changes in Environmental Management Programs;
 - Funding needs to implement new issues or changes in the Environmental Management Programs.

5.9 The Office of Contractor Assurance

The Office of Contract Assurance (OCA) provides oversight of LBNL's management systems and operating processes to ensure that compliance, operational support for science, best management practices, and continuous improvement are achieved at LBNL. The OCA is a fully independent and internal assurance organization, and is authorized to have unrestricted access to personnel, records, and other information sources necessary to carry out its duties.

At the direction of the Director of Institutional Assurance, the OCA coordinates independent third-party reviews in areas of business, finance, operations, ES&H, as well as other selected areas. The OCA will oversee all LBNL operations and business systems using an internal control system, which is designed to assure UC and LBNL management that operations are effective and efficient, financial reporting is reliable, and both are in compliance with applicable laws and regulations.

The OCA interfaces with EH&S Division and the SAC in managing, coordinating, and supporting ES&H assurance activities, in particular the Division Self Assessment Program; Peer reviews; the ES&H Technical Assurance Program; and independent audits of technical programs as needed. The OCA also provides technical support to the EH&S Division Director for developing ES&H performance objectives and criteria for division self-assessments, ES&H technical assurance, and DOE Contract 31, Appendix B self-assessments (see RPM—Contractor Performance Management).

5.9.1 Issues Management Program

The OCA is responsible for the LBNL Issues Management Program (IMP). The IMP encompasses the continuous monitoring of work programs, performance, and safety to promptly identify issues to determine their risk, significance, and causes, and to identify and effectively implement corrective actions to ensure successful resolution and to prevent the same or similar problems from occurring.

This comprehensive institutional program comprises four program manuals, two databases, and two implementing procedures. These tools define and implement the process for issues identification, tracking, resolution, closure, validation, and effectiveness of corrective actions. Issues that are governed by this program include program and performance deficiencies or nonconformances that may be identified through employee discovery, internal or external oversight assessment findings, suggested process improvements, and associated actions that require formal corrective action. Issues may also be identified in and/or may result in Root Cause Analysis reports, Price-Anderson Amendments Act reports, Occurrence Reporting and Processing System reports, Accident Investigation reports, assessment reports, and External Oversight reports.

Analysis of issues, individually and collectively, is performed in order to identify programmatic or system issues, and to identify recurrence of issues, generic issues, trends, and vulnerabilities at a lower level before significant problems result.

Lessons Learned and Best Practices, based on LBNL's and other facilities' operating experiences, are developed to ensure ongoing improvement of safety and reliability, to prevent

the recurrence of significant adverse events/trends, and to determine implementation strategies that will help LBNL successfully meet the missions and goals set forth by the DOE.

Many of the issues and concerns of the IMP are safety related. Therefore, OCA interfaces with the EHS Division in managing, coordinating, and supporting ES&H assurance activities, in particular the Division Self-Assessment Program, Peer reviews, the ES&H Program Self-Assessments, and independent audits of technical programs as needed. The Office also provides technical support to the EHS Division Director for developing ES&H performance objectives and criteria for division self-assessments, ES&H technical assurance, and DOE Contract 31, Appendix B, *Self-Assessments* (see RPM Organizational Self-Assessment Policy).

5.9.2 Requirements Management Program

The OCA is responsible for the Requirements Management Program, which plans, develops, implements, and manages the LBNL requirements management process in support of institutional prime contract administration, and integrating this process with existing LBNL operating and business processes. This program addresses ES&H requirements along with any other external requirements. Additional responsibilities include facilitating expedient applicability review and impact assessment of new and modified contractual and regulatory requirements as well as collaborating with line management to integrate new and revised requirements into existing operating and business processes. (see RPM—Requirements Management Policy).

5.10 Interface with UC Berkeley ES&H Department

For work carried out in LBNL and UC Berkeley spaces, a Partnership Agreement has been renewed that clarifies responsibilities and oversight of safety requirements. Although the UC Berkeley campus and Berkeley Laboratory safety systems and procedures differ, they are consistent with the principles of integrated safety management and provide equivalent protection.⁶

The UC Berkeley safety system governs LBNL-funded activities in campus spaces exclusive of the Donner laboratory facilities. LBNL principal investigators have an obligation to Berkeley Laboratory line management to provide a safe workplace on campus for all LBNL-sponsored work by complying with the UC Berkeley safety system. The LBNL safety system governs work in LBNL spaces, which include Donner laboratory.

6.0 ES&H Management System Mechanisms

6.1 Introduction

This section identifies the set of core Integrated Safety Management System (ISMS) requirements applicable to all LBNL organizations, provides the foundation for Environment, Safety, and Health (ES&H) management at LBNL, and includes the necessary detail required for implementation of ISMS directly and through other LBNL documents, including division-specific ISM *Implementation Plans* (see Appendix A). This ISM *Management Plan*, the *ES&H Manual*, the Division ISM *Implementation Plans* and the *Environmental Management System (EMS) Plan* are the principal mechanisms for implementing ISMS and EMS at LBNL. These four facets, complemented by assessment and assurance, provide a structure to ensure work is performed safely and in compliance with applicable ES&H requirements consistent with the graded approach. The primary focus of the ISMS is to provide the worker with a safe work environment, ensure that necessary resources are made available to perform the work, and establish requirements for adequate procedures and controls to ensure that work is performed safely while minimizing environmental impacts. The ES&H roles, responsibilities, and authorities described in this section are developed and practiced to drive the integration of safety into all work activities. The objective of this effort is for the ES&H Management System to be completely integrated within the Laboratory's work and business processes.

Planning the work activity is the starting point for analyzing and understanding hazards, identifying environmental impacts, and determining specific ES&H requirements and controls (referred to as operational controls, an element of the EMS plan). Figure 6.1 illustrates that work conducted safely while minimizing environmental impacts is accomplished by following the seven ISMS Guiding Principles while applying the five Core Functions discussed in Section 4 in the Institution/Facility/Activity Process. It also shows the three levels of management requirements nested around accomplishment of the work activity. During the planning process, priorities are balanced with resources and constraints to maximize the likelihood of a successful outcome for the work activity envisioned. The results of the work process are analyzed for potential improvements throughout work planning and completion phases, and after the work is finished in an ongoing process.

A work activity must satisfy requirements and constraints based on its defined work scope, hazard, and environmental impact analysis, and the applicable controls established by the institution and the facility where the activity is conducted. The institutional requirements presented in this *Management Plan* and the *ES&H Manual* are used to ensure Laboratory-wide consistency. Similarly, a division or facility may establish a required practice, constraint, or limit to ensure consistency and compatibility of operations within a facility. Information gained from evaluations of the work—operational results, worker suggestions, self-assessments, audits, and so forth—is used as feedback to adjust and improve requirements and controls at the work activity, facility, and institutional levels.

This section describes how the seven ISMS Guiding Principles and five Core Functions at the Institution, Division/Facility, Line Management/Activity (e.g., work lead), and individual levels are aligned and nested within one another and become broader or more specific as one looks up or down the management chain. It also describes how the seven Principles and five Functions are interwoven during the planning, execution, and evaluation of work activities from the institutional down through the individual level.

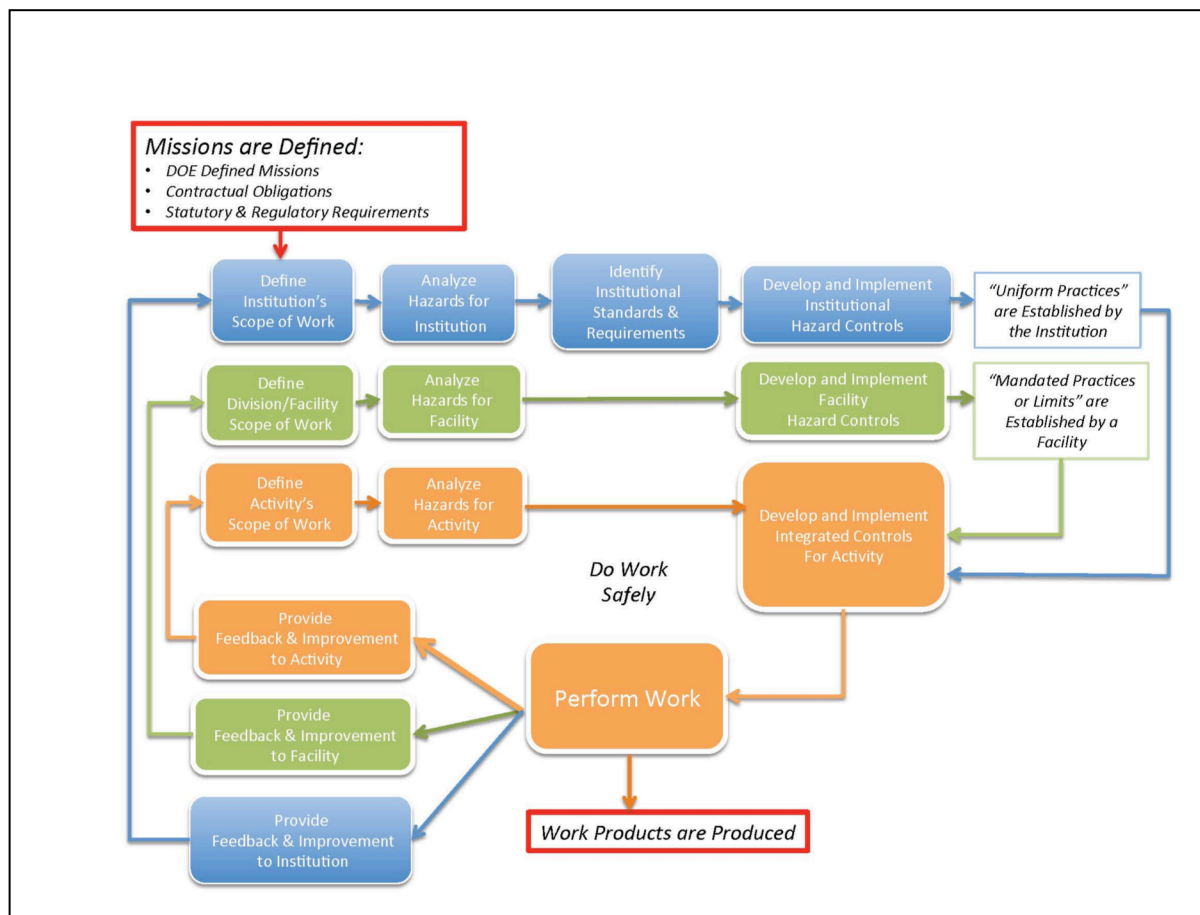


Figure 6.1 Integrated ISM Work Cycle. Institution, Facility and Activity level hazard control requirements are integrated for work at the Activity level.

6.2 Roles and Responsibilities

6.2.1 ISMS Guiding Principle 1—Line Management Responsibility for Safety

Line management is responsible for the ES&H system and is ultimately responsible for ES&H at the Laboratory. To meet the goal of integrating safety into all work and workplaces, line management must provide an unbroken linkage of management personnel for direction, operations, performance, and effectiveness. Line managers are individual managers in that linkage, with specific leadership responsibilities for work and job tasks, including safety. To

achieve such a linkage at LBNL poses unique and special challenges to meeting the principles of ISM. For example:

Postdoctoral scholars may oversee, direct, and assign tasks to co-workers, yet are not permanent employees or recognized by law as supervisors.

Groups visiting LBNL to use research facilities must incorporate safety considerations into the conduct of their work on-site and, in order to meet the principles of ISM, must ensure that the management linkage is intact and includes the lead of the group and each worker.

LBNL has developed the “safety line manager” and “work lead” concepts to address this challenge to rigorous implementation of ISM (see Glossary, the *ES&H Manual*—ES&H General Requirements). Staff members who are not line managers or supervisors as defined in the RPM—Relations With Employee Organizations, but who have been authorized by their supervisors to direct, train, and assign tasks to others are accountable for the safety of those under their direction as a Work Lead. This group includes, for example, senior postdoctoral staff and visiting project leaders. Because these individuals derive their work and thereby their safety responsibilities from designated supervisors, the supervisor in these cases is ultimately responsible for adherence to EHS Division policies and safe work practices. “Safety line manager” is a generic term for individuals directly responsible for an operation, activity, or group of activities. The safety line manager may be at any level within the organization and is formally identified by the activity’s authorizing individual. In most cases, the safety line manager will be directing the work of others as part of the operation or activity.

6.2.1.1 Line Managers Are Responsible for Participating in the ES&H System as Guided by Their Expectations, Roles, and Responsibilities

- 1) ES&H expectations, roles, and responsibilities are to be established for each employee, including supervisors and managers using the approved Performance Management Process (PMP). Expectations are to be documented and communicated, and the employee given the opportunity to provide feedback.
- 2) A substantive ES&H performance assessment addressing expectations and accomplishments is to be included in each individual’s performance appraisal. For managers and supervisors, the appraisal is also to address performance in establishing and implementing ES&H processes. Refer to [RPM: Employee Performance Evaluations](#).
- 3) ES&H responsibilities and ES&H performance are to be explicit considerations during the annual performance evaluation process and important factors in determining salary actions and promotions.
- 4) Each division, as part of its ISM *Implementation Plan*, must describe in detail how the issue of safety supervision is to be addressed. The need is recognized for diverse solutions across the Laboratory due to differences including type of staffing, number and type of guests, and the existing systems for integration of safety into the management structure. One aim of developing the division ISM *Implementation Plans* is to present policies and

processes that effectively address this challenge. Determining the effectiveness of each division in meeting this aim is part of the self-assessment process.

6.2.1.2 Workers Are Responsible for Participating in the Development of the ES&H System and for Working According to Established Laboratory Processes/Procedures as Guided by the Expectations, Roles, and Responsibilities Assigned to Them by Line Management

Each worker, supervisor, and manager is directly responsible for ensuring his or her own safety and looking after coworkers while providing responsible stewardship of the environmental resources in his or her care; and for promoting a safe, healthful, and environmentally sound workplace and community. It must be recognized that not all individuals functioning as work leads at LBNL are formally recognized as supervisors or managers as defined in the *Requirements and Policies Manual*. Nonetheless, LBNL policy makes clear that work leads have distinct responsibilities for management of safety in their work areas.

- 1) The Laboratory's goal is to practice ES&H by taking actions to avoid the potential for injury to people or damage to property, and to provide responsible stewardship of the environmental resources in its care. The principal means of instilling responsibility and enforcing accountability for ES&H are:
 - a) Communicating ES&H expectations to employees;
 - b) Reinforcing expectations through timely verbal feedback;
 - c) Involving workers in policy and procedure development, work planning, hazard control, and continuous self-improvement (such as division assessment activities);
 - d) Formal appraisal and salary actions implemented annually for each employee;
 - e) Awards and recognition for notable contributions to ES&H;
 - f) Corrective action in cases where ES&H system performance or individual performance does not meet expectations.
- 2) LBNL safety accountability policy recognizes that the great majority of accidents are the result of organizational deficiencies. As such, management accepts accountability for these deficiencies and works with staff to investigate, understand, and remediate areas of deficiency. The Lab recognizes that humans are fallible and people make errors. Rather than placing blame and applying punitive actions, the Lab will consider individuals involved as having made an 'honest mistake' and will work with them to understand the context of the incident and prevent similar errors.

However, a completely no-blame culture is neither reasonable nor desirable, as a small fraction of accidents do result from what are considered unacceptable behaviors. Applying a general pardon for unsafe acts would create a lack of credibility and accountability among staff members. The types of behaviors that are considered unacceptable include willful

safety violations and/or reckless behavior related to safety. Feedback and corrective action for individual performance not meeting expectations will be taken consistent with Laboratory personnel policies and procedures for violations of Laboratory ES&H requirements.

- 3) Feedback and corrective action when the ES&H system does not meet expectations, such as the occurrence of an incident or a systemic failure, requires the organization authorizing the work to perform an investigation of the relevant circumstances or to assist DOE investigators in conducting a review that falls within their purview. The investigation will involve the appropriate subject matter experts (SMEs), certified root-cause analysts, and workers. Necessary changes are to be made to the relevant policies, procedures, or hardware based on the findings of the authorizing organization's review.
- 4) Accountability applies to all levels of employees, including managers and supervisors. It calls for positive reinforcement for meeting Laboratory ES&H expectations and negative consequences for failing to do so. The management of each division is responsible for having in place effective processes to implement, measure, and reinforce Laboratory ES&H expectations. Each division is to use its division awards and recognition program to promote exemplary ES&H behavior and performance.
- 5) Each division will hold its employees accountable for compliance with Laboratory ES&H requirements through personnel processes such as performance appraisals, salary-management actions, awards and recognition, and the application of corrective action. In addition:
 - a) Each worker, immediate supervisor, and manager is directly responsible for ensuring that accidents and injuries are properly reported. Accurate and complete reporting is necessary.
 - b) All employees are responsible for bringing ES&H concerns promptly to the attention of the appropriate manager or supervisor for resolution. If a satisfactory response is not received, the senior manager for the organization should be contacted, followed by the EHS Division Director.
- 6) Each employee is directly responsible for ensuring his or her own safety, the safety of others, and minimizing the environmental impacts of his or her actions. Individuals are responsible for following all ES&H work instructions, including signs, procedures, Job Hazard Analyses (JHAs), and workers' aids. If the work instructions cannot be followed safely as presented, or if they present a new hazard, the employee is responsible for notifying the appropriate individuals and assisting, as appropriate, in modifying the work instructions. All members of the workforce are held accountable for meeting the Laboratory's ES&H requirements as defined in this *Management Plan*, the ES&H Standards Set in Contract 31, and as specified in the *ES&H Manual* and other work instructions.

6.2.2 ISMS Guiding Principle 2—Clear Roles and Responsibilities

Clear roles and responsibilities are established and maintained.

6.2.2.1 ES&H Roles, Responsibilities, and Authorities (RRAs) for Organizations and Individuals Are Clearly Defined

- 1) The authorizing organization is responsible for authorizing work. Authorizing organizations are distinguished by having control of the funding as well as responsibility to the sponsor for accomplishing the programmatic mission or activity.
- 2) The responsibility for work authorization may be delegated to another organization along with the funds to accomplish a specific work element. All delegations of work-authorization responsibility must be formally documented and approved by the management of each division involved. Irrespective of the number or level of work authorization delegations, the program organization retains ultimate responsibility back to the sponsor for the conduct of the work.
- 3) Work performed as services by one organization for another is an area of particular concern requiring special attention. The appropriate division of ES&H Roles, Responsibilities, and Authorities (RRAs) between requesting and service-providing organizations must be clearly defined.
- 4) The authorizing organization is responsible for the activity's conduct, including accomplishing the technical objectives and ES&H requirements within the defined budget. The individuals responsible for: (a) authorizing the work activity; (b) validating that the proposed work falls within the established ES&H envelopes (i.e., facility or operational concurrence); and (c) supervising the specific work (i.e., ensuring work requirements are met) must be clearly identified and their ES&H RRAs clearly defined.
- 5) The individual supervising work is responsible for identifying the job assignments that have specific ES&H RRAs and assuring that they are clearly defined. This may be documented in ES&H documents [e.g., the *ES&H Manual*, Activity Hazard Documents (AHDs), Radiological Work Authorizations (RWAs), JHAs, or in division-specific documents]. This information is to be provided to the individual performing the work and to be readily accessible to others who should be aware of the ES&H RRAs.
- 6) Each division director is responsible for identifying a building manager for each facility to fulfill responsibilities identified in the *ES&H Manual* and the *Building Manager Policy and Procedures* (PUB-541).
- 7) Each division is to have a division safety coordinator to provide independent oversight of the division's organizations, facilities, and activities to assure the proper implementation of the ES&H program. In this context, "independent" means that the division safety coordinator is not in the direct line of authorization or management of the activities being evaluated. When this condition is not met, there shall be a separate independent evaluation of the activity to eliminate any potential conflict of interest.

- 8) LBNL's EHS Division is responsible for supporting the management chain by participating in work activity planning, monitoring operations for compliance, and providing the information needed to the appropriate staff and management to help maintain a safe work environment, while minimizing environmental impacts.

6.2.2.2 The Management Chain Is Defined for Each Work Activity So Roles and Responsibilities Are Clear

- 1) For each work activity, the individuals serving in the management chain (i.e., first-level work lead up to the responsible division director) are to be identified by the organization authorizing the work. The management chain has direct control over the funding for the work activity. Each division ISM Plan must describe the management chains and relationships used to manage the division. The work lead and first-line supervisors are key individuals in the structure; they must know their people, the work, and the structure both up and down as well as across the structure. Safety documentation must, at a minimum, specify the work lead, safety line manager, and division director. Additional names should be added if they are key to the allocation of ES&H resources or ES&H reporting.
- 2) The management chain is responsible for: (a) defining the scope of work; (b) ensuring that the hazard and environmental impact control system is effectively implemented; (c) ensuring that workers have the skills, knowledge, and abilities (SKAs) to initially evaluate the hazards and identify the environmental impacts associated with an activity; (d) ensuring that workers have the SKAs, including physical capabilities, to perform the assigned work safely while minimizing environmental impacts; (e) authorizing the defined work, subject to the appropriate controls; (f) ensuring that the workers perform the work safely while minimizing environmental impacts and in conformance with applicable institutional, facility, and activity controls; (g) monitoring and, as appropriate, strengthening the work activity's ES&H performance; and (h) soliciting worker input.

6.2.2.3 LBNL's Commitment to Safety and Stewardship of the Environment through the ISMS and EMS Is Extended to Subcontractors and Subcontract Employees for Whom LBNL Has ES&H Responsibility by Describing Clear Roles and Responsibilities

- 1) To ensure the Laboratory's commitment to safety and stewardship of the environment, ISMS and EMS concepts are extended to all of its service subcontractors, lower-tier service subcontractors, and their employees, including construction subcontractors. Additionally, ES&H requirements are to be incorporated into the subcontracts, as appropriate, and flowed down to the lower-tier subcontractors as appropriate. The subcontractors are responsible for the flow-down of ES&H requirements to their lower-tier subcontractors and the ES&H interactions with them.
- 2) Those activities identified on the Designated Commercial Services List are determined to be noncomplex and nonhazardous when performed in a work location having only negligible hazards present. Noncomplex and nonhazardous tasks are excluded from the ISM contractual flow-down requirements. The Designated Commercial Services List can be found in:
[LBNL --PROCUREMENT STANDARD PRACTICES, Section: 28 Bonds and Insurance. Subject: 28.2 Insurance and Indemnification](#)

- 3) An ES&H specialist (usually from the EHS Division) determines the selection of appropriate subcontractor ES&H requirements to ensure that subcontractor ES&H procedures appropriately meet Laboratory standards. All appropriate hazards and environmental impacts are to be communicated between the Laboratory and the service subcontractor. Hazards and environmental impacts to be communicated include the Laboratory's work activity and facility work area hazards, and the subcontractor's work-activity hazards and environmental impacts. Divisions may also establish procedures specific to their requirements.
- 4) The subcontract ES&H requirements are to be consistent with the flow-down requirements of Contract 31, Clause I.86, and this *Management Plan*. The Procurement and Property Management Department (Procurement) is to use Contract 31, *Management Plan* requirements, and the subcontractor ES&H requirement determination to select the appropriate subcontractor-ES&H requirements according to Procurement procedures.
- 5) The organization requesting a subcontract for work is to evaluate the planned subcontract work using the process described in the *ES&H Manual, Subcontractor Job Hazard Analysis* Chapter, Work Process B. *Creating an sJHA*. The appropriate ES&H SME can assist the requesting organization. The appropriate ES&H SME is to be notified of all requests for a subcontract where the work is categorized as complex or hazardous. Subcontractor interaction on the development of their hazards, environmental impacts, and controls may be necessary and can be facilitated through use of a Safety Plan or Safety Checklist.
- 6) The subcontractor is to be informed of the applicable Laboratory location hazards and environmental impacts for the work activity. The subcontractor must also obtain the appropriate training as determined by the ES&H SME.
- 7) A subcontractor performing work categorized as complex or hazardous is required to manage and perform the work according to the subcontractor's ES&H management system, which, at a minimum, must fulfill the requirements of Contract 31, Clause I.86, and be available for Laboratory review through Procurement. In addition, at the determination of the ES&H SME, a subcontractor may be required to provide a site- and/or job-specific ES&H plan based on its ES&H management system. Procurement is to obtain this plan. The requesting organization and the appropriate ES&H SME are to review it for operational and technical accuracy and completeness. Then, together with Procurement, they provide the approval through Procurement process.
- 8) Employees of another DOE facility in which work is performed under an approved ISM program (e.g., Argonne National Laboratory, Brookhaven National Laboratory) should be treated as LBNL workers regarding ES&H matters when working at LBNL. Such employees are required to satisfy all Laboratory ES&H requirements specified in applicable Laboratory ES&H documentation [e.g., JHAs, Job Hazard Questionnaires (JHQS), AHDs] when performing services for the Laboratory. However, LBNL may give equivalencies for training provided by their employers.

6.2.2.4 ES&H Documents Are Written with Worker and Stakeholder Participation So That They Are Readily Understandable by the Individuals Performing and Managing the Work, Including Clear Roles and Responsibilities

- 1) The purpose of the Laboratory's ES&H documents (i.e., manuals, plans, and procedures) is to enable all employees, subcontractors, guests and visitors to work safely while minimizing environmental impacts.
- 2) The authors and approving organizations of ES&H documents are responsible for ensuring that instructions are workable and readily understandable to the individuals performing and managing the work. The authors are responsible for ensuring the participation of appropriate workers in the development of ES&H documents that affect them. The authors and approving organizations are likewise responsible for ensuring that ES&H documents are consistent with applicable rules and requirements.
- 3) The resulting ES&H documents are to be readily available to all individuals who need access to the information. Work instructions should contain the information needed to perform the work safely. When describing hazards and specifying controls, instructions should minimize references to documents not readily available at the worksite.
- 4) In situations where requirements are particularly complex or ambiguous, the organization authorizing the work is to use the appropriate ES&H professionals and other SMEs to interpret and assist in developing ways to satisfy requirements. Workers who will be performing the work should be consulted during development to verify that the resulting instructions make sense.
- 5) Workers are strongly encouraged to be actively involved in the development of operating procedures specific to their work activities.
- 6) Individuals are responsible for following ES&H documents, as written, or having the documents changed, as required, prior to performing work.

6.2.3 ISMS Guiding Principle 3—Competence Commensurate with Responsibilities

Personnel possess competence commensurate with responsibilities.

6.2.3.1 Individuals Receive Appropriate Institutional ISMS Training

- 1) All Laboratory employees are to be trained in the principles and functions of ISMS and the Plan, Do, Check, and Act Concepts of the ISMS and EMS plans at a level appropriate for their specific job duties and responsibilities. The Laboratory is responsible for developing the institutional ISMS training courses such as ESH0010, *Overview of EH&S at LBNL*.
- 2) Each division is responsible for ensuring that its employees receive ISMS training, including facility- and activity-specific training as appropriate, in an effective and timely manner.
- 3) Each division is responsible for assuring that the required ISMS and ES&H training is appropriately documented in the JHA System, and reviewed and updated at least annually.

6.2.3.2 Individuals Receive Appropriate Job-Specific ES&H Training

- 1) The individual's home organization ensures base skills through the hiring process and performance review.
- 2) The individual supervising the work activity is responsible for ensuring that the training necessary to do the assigned work in accordance with the ES&H requirements is identified and communicated to the individual's home organization.
- 3) All personnel are to receive training to perform their work in a safe and environmentally responsible manner.
- 4) Training, with appropriate testing or evaluation, demonstrates competency to meet ES&H standards and facility- and activity-specific requirements.
- 5) Accomplishment of formal ES&H training is documented in the Berkeley Lab JHA Training Record System. Documentation of informal training, such as job-specific training on procedures, on-the-job training, maintenance of personal protective equipment, and so forth is the responsibility of the safety line manager and home organization supervisor and should follow the guidance given in the *ES&H Manual* Section 24.4 *ES&H Training Database*.
- 6) The authorizing organization is responsible for ensuring that the resources necessary for required ES&H training are provided by that organization or another appropriate organization.
- 7) Home organizations are to verify that their personnel have the required training.
- 8) The work activity safety line manager is to ensure that the personnel supporting the activities have the required ES&H training, including facility-specific training.

6.2.3.3 Individuals Are Qualified to Perform Assigned Work

- 1) Each individual must possess the necessary skills, knowledge, and abilities, including physical capabilities, to carry out his or her assigned tasks. The base skills are to be ensured by the home organization.
- 2) The individual supervising the work activity is responsible for identifying: (a) the qualifications, including appropriate medical certifications and surveillance necessary to carry out the work; and (b) the individuals with the qualifications and training to perform the work.
- 3) Each individual is responsible for completing all required training identified in his or her JHA/JHQ and maintaining necessary certifications with the cooperation and support of the management chain.

6.3 Work Planning and Prioritization

6.3.1 ISMS Core Function 1—Define the Scope of Work

6.3.1.1 The Work Activity Is Defined

- 1) The organization authorizing a given work activity is responsible for: (a) stating the technical objectives; (b) defining the work elements to be performed; (c) identifying the facility in which the work will take place; and (d) identifying the individual who will be supervising the work activity.
- 2) The management chain that results from these determinations is responsible for ensuring the work activity is properly analyzed, controlled, performed, and monitored.

6.3.1.2 The Graded Approach Process Is Consistently Applied

- 1) An individual may initiate and perform a work activity without the imposition of formal work controls if it involves only activities commonly performed by the public, as explained in the *ES&H Manual*. In no instance will an individual initiate or perform a work activity not commonly performed by the public without authorization of an appropriate person in the management chain. Individuals are expected to work within their job scopes and work assignments. Using the graded approach, senior researchers would be expected to have a wide range of authorization within their job scope as compared with graduate students or technicians new to a lab and in the process of developing their skills to meet their new job scope.
- 2) The authorizing organization is responsible for ensuring that the greater the hazards associated with an activity, the more rigorous the work-planning process required. More rigorous processes will also be required if significant environmental impacts are present. The objective of the work-planning process is to ensure the hazards and environmental impacts associated with the work activity are clearly understood and appropriately addressed. To ensure this objective is met, relevant ES&H professionals and SMEs are to be used during the work-planning process, as appropriate. These individuals provide advice on the application of the *ES&H Manual*. The detail of work instructions is tailored to the consequence of the activity and the competency of the workers.
- 3) Consistent with the provisions and levels described in Section 7 and the *ES&H Manual*, the safety line manager is responsible for: (a) authorizing the work activity; (b) ensuring the facility and/or operational ES&H envelope; (c) supervising the work; (d) providing ES&H support; and (e) assuring worker involvement in the analysis of hazards and environmental impacts, and in determining appropriate work controls and environmental impact controls to be applied to the work activity.
- 4) Work is to be authorized by the appropriate level of management as described in Section 7 of this Plan and detailed in the *ES&H Manual*, Chapters 6, 10, 31 and 32.

6.3.2 ISMS Guiding Principle 4—Balanced Priorities

Resource allocations are balanced, making ES&H a priority in project planning and execution.

- 1) The authorizing organization is responsible for allocating sufficient resources to ensure safe and compliant operations while minimizing environmental impacts.
- 2) A work activity proceeds only with a reasonable expectation by the management chain that there will be sufficient resources to ensure ES&H requirements are satisfied over the length of the project, including closeout activities.

6.4 Hazard Analysis

6.4.1 ISMS Core Function 2—Analyze the Hazards and Environmental Impacts

6.4.1.1 Hazards and Environmental Impacts Are Identified and Analyzed for All Work Activities

- 1) The authorizing organization is responsible for ensuring that the associated hazards and environmental impacts are identified. ES&H professionals are to be used in the hazard- and environmental-impact-identification process, as appropriate. Workers are to be provided an opportunity to participate in the process of identifying hazards and environmental impacts.
- 2) Hazards and environmental impacts are to be identified and analyzed consistent with the provisions of the *ES&H Manual*, Chapters 6, 10, 31 and/or 32. ES&H professionals and SMEs provide advice on the application of the *ES&H Manual* and applicable ES&H Standards to ensure consistent implementation across LBNL.
- 3) Each individual is responsible for making conscious considerations of the ES&H implications of their actions whether or not formal hazards analysis, identification of environmental impacts, and their impacts and documentation are required.

6.4.1.2 Job Hazard Analysis Documents Are Developed for Appropriate Work Activities

- 1) The intent of the JHA is to ensure front-end identification of all hazards and environmental impacts associated with a work activity. A JHA is required when a work activity is beyond that commonly performed by the public. The organization authorizing a work activity is responsible for ensuring that a JHA is prepared, reviewed, and approved consistent with the provisions of Section 7 of this Plan, and the *ES&H Manual* (Chapters 6, 10, 31 and 32). For Berkeley Lab employees and affiliates the format and instructions for the JHA are contained in the *ES&H Manual*, Chapter 32, and build upon the Work Authorization requirements found in Chapter 6. The completed JHA, with appropriate RWAs, AHDs, etc., provides the authorization for the work activity once a work review confirms readiness. The scope of a work review is tailored to the scope of the work using the graded approach and may be a simple conversation between the worker and supervisor, or it may involve a rigorous checklist prior to startup of a complicated experimental device. For construction subcontractors the process for developing Construction –JHAs is described in *ES&H*

Manual Chapter 10, and for Non-Construction-Subcontractors it is described in Chapter 31. Each of these business processes accomplishes the same objective of hazard identification and development of appropriate controls tailored to the workers performing the work.

6.4.1.3 Appropriate Sections of the *ES&H Manual* Are Applied in the Process of Analyzing Hazards and Identifying Environmental Impacts

- 1) The specific hazards and the impacts of significant environmental aspects identified with the work activity are to be analyzed according to the requirements of the *ES&H Manual*, Chapter 6 *Safe Work Authorizations*, and by the inclusion, as necessary, of the appropriate ES&H professionals.
- 2) The identified hazards and the impacts of the significant environmental aspects are to be clearly communicated to all involved in the activity.
- 3) The authorizing organization and the individual supervising the work are responsible for periodically reviewing the hazards and environmental impacts associated with the work activity as described in the *ES&H Manual*, Chapter 6.

6.5 Control and Mitigation Hazards and Environmental Impacts

6.5.1 ISMS Core Function 3—Develop and Implement Hazard and Environmental Controls

6.5.1.1 Uniform Processes Govern Development of ES&H Documents

- 1) Uniform requirements and processes are to be applied across the Laboratory for consistent and comprehensive completion of the ES&H documents cited in this *Management Plan*, as well as other major ES&H documents by using the provisions contained in Section 7 and the *ES&H Manual*. The described requirements and processes provide the essential conditions, content, format, and other specifics for these documents. Appropriate implementation and use of applicable ES&H Standards are to be incorporated as described in the *ES&H Manual*.
- 2) A uniform process is to be applied across the Laboratory for the development of ES&H and ES&H-related procedures consistent with the provisions established in the *ES&H Manual*. This process identifies when procedures are to be developed, specifies content based upon the hazards and environmental impacts being managed as well as whom to include in the initial review of new provisions, and provides a recommended format for structuring the procedure.

6.5.1.2 Requirements in the *ES&H Manual* Are Applied in the Process of Developing and Implementing Controls

- 1) The individual supervising the work activity is responsible for ensuring that tailored controls are developed for each hazard associated with the work activity and to reduce the impacts of significant environmental aspects. The tailored controls or reduction of impacts including

the appropriate incorporation of engineered and administrative controls are to be developed and implemented consistent with Section 7 and the *ES&H Manual*.

- 2) As appropriate, SMEs are to be used in development of work and environmental controls. These individuals provide advice on application of the *ES&H Manual* and applicable ES&H Standards to specific work activities, to ensure consistent implementation across LBNL and the reduction of significant environmental impacts.
- 3) Workers are strongly encouraged to be actively involved in the development of operating procedures specific to their work activities.
- 4) The authorizing organization is responsible for approving the work and environmental controls and ensuring that appropriate and graded use of quality assurance principles and processes as described in the *Operating and Quality Management Plan* (OQMP, PUB-3111) are incorporated and used.
- 5) The designated controls are to be clearly communicated to all associated with the activity, and whose work proximity makes it prudent that they are aware of the controls.
- 6) The authorizing organization and the individual supervising the work are responsible for periodically reviewing and ensuring the adequacy of the controls associated with the work activity and the effectiveness of the engineered and administrative controls incorporated.

6.5.2 ISMS Guiding Principle 5—Identification of ES&H Standards and Requirements

ES&H Standards and requirements are identified and implemented. The ES&H Standards Set provides the first tier of necessary and sufficient standards to be implemented. The basis and particulars are presented in Sections 10 and 12.

6.5.2.1 Programs for Preventing Injuries Are Defined

- 1) Each division is responsible for having in place defined programs to prevent injuries. An ergonomics program developed consistent with the *ES&H Manual* is an example of a defined program to prevent injuries.
- 2) Each division is responsible for analyzing all the injuries associated with its organization's operations and facilities.
- 3) Injury and illness statistics and related information are accessible through an access-controlled database [Supervisor Accident Analysis Reporting (SAAR) Database] maintained by the EHS Division.
- 4) Using resources such as the Lessons Learned program, each division is responsible for assessing whether existing practices or conditions could materially contribute to the organization's accident and injury rates.
- 5) Each division is responsible for developing programs to address (a) the specific injury and illness categories driving the organization's days away, restricted, transferred (DART)

numbers; and (b) other practices or conditions that could materially affect the organization's accident and injury rates.

6.5.2.2 ISMS Principles and Commitments Are Addressed in ES&H Documents

- 1) The *ES&H Manual* and other Laboratory ES&H documents are to address ISMS principles and commitments.
- 2) The *ES&H Manual* describes the approaches the Laboratory uses to implement the ISMS and EMS. It references and implements the ES&H Standards Set as they relate to specific work, hazards, and environmental impacts.
- 3) The division ES&H-related documents (e.g., AHDs, Division ISMS Plans, self-assessment plans, training plans) are based on ISMS principles and incorporate the applicable requirements of the ES&H Standards Set, all per the provisions of this *Management Plan* and the *ES&H Manual*.

6.5.3 ISMS Guiding Principle 6—Hazard & Environmental Controls Tailored to Work Being Performed

Hazard and environmental controls are tailored to the project work. Consideration of controls as they apply to the workplace hazards and environmental impacts shall take into consideration regulatory requirements and the level of control needed.

6.5.3.1 Appropriate Sections of the *ES&H Manual* Are Applied in Tailoring Controls to Specific Work Activities

The individual supervising the work activity is responsible for ensuring that tailored controls are developed and implemented for each hazard and environmental impact associated with the facility and work activity, consistent with the provisions of Section 7 and the *ES&H Manual*.

6.6 Work Authorization and Performance

6.6.1 ISMS Guiding Principle 7—Operations Authorization

Operations are authorized before work begins. Depending upon the scope, work may be authorized by line management or, in conformance with the graded approach, may require extensive review by ES&H professional staff and engineering experts, and explicit authorization by the division director. Some activities may require authorization by outside agencies. Further information regarding work authorization is provided in Section 7.0.

6.6.1.1 Work Activities Are Appropriately Reviewed and Authorized Before Starting

- 1) Work activities are to be reviewed and authorized before the work begins, consistent with the provisions of Section 7 and the *ES&H Manual* (Chapter 6).
- 2) The safety line manager solicits worker review and comment of proposed operating plans or procedures before work is authorized.

- 3) The authorizing organization is responsible for ensuring an appropriate work authorization review is conducted to validate satisfaction of the ES&H requirements.
- 4) The scope and rigor of the work authorization review will vary based on the characteristics of the work activity. The requirements of the work authorization review process are defined in the *ES&H Manual*, Chapter 6.
- 5) When a person calls 7911 or 6999 for an emergency situation, the Protective Services Department automatically becomes the authorizing organization for the emergency response, without any documentation (other than their Policies and Procedures), to respond to that incident. The Protective Services Department is responsible for ES&H and the work practices of the response. The management of the response is handled via a unified command involving appropriate staff from this organization.

6.6.2 ISMS Core Function 4—Perform Work within Controls

6.6.2.1 Work Is Appropriately Controlled

- 1) Each individual is responsible for adhering to the ES&H controls established for the work activity and informing the supervisors when controls are believed to be inadequate.
- 2) The safety line manager is responsible for ensuring that workers understand the ES&H controls and understand that work is to be performed according to the defined work controls.

6.6.2.2 Applicable Procedures and Governing Documents Are Followed

- 1) The individual supervising the work is responsible for ensuring that each worker has immediate access to the work activity's governing procedures and ES&H documents.
- 2) Steps are taken by the individual supervising the work to ensure that each worker on the activity is knowledgeable concerning the governing procedures and work and environmental controls.
- 3) All work is to be performed in conformance with work instructions, including signs, AHDs, JHAs, workers' aids, and other governing documents. If the work instructions cannot be followed safely as presented, or if they present a new hazard, the employee is responsible for notifying the appropriate individuals and assisting, as appropriate, in modifying the work instructions.

6.7 Performance Monitoring and Feedback

6.7.1 ISMS Core Function 5—Provide Feedback and Continuous Improvement

6.7.1.1 Work Activities Are Monitored

- 1) The individual supervising the work is responsible for monitoring the work activity to ensure that the governing procedures and ES&H documents are being followed. Safety line

managers observe their workers at appropriate intervals to verify that work is to be performed according to the defined ES&H work controls.

- 2) If there is indication that the proper limits or controls of a work activity are not being followed, the activity is to be evaluated immediately by the authorizing organization to confirm the indication. Once confirmed, the work activity shall be suspended in a controlled and safe manner, if appropriate, until remedial actions are taken.
- 3) In the event it is determined that the approved limits or controls of a work activity are exceeded, the affected work and/or facility is to be placed in a safe condition, and further work is to be suspended until appropriate remedial actions are taken. *Work Activity Authorization* and *Facility Operation Authorization* provisions are discussed further in Section 7 and the *ES&H Manual*, (Chapter 6).
- 4) Each worker is responsible for bringing to the attention of the immediate supervisor problems with the applicable limits or controls and opportunities for improvement associated with the work or governing procedures. The supervisor is responsible for the evaluation and appropriate action.
- 5) Each worker is empowered to stop work if there is an unsafe or unapproved condition. Prompt notification of the immediate supervisor is required. Resumption of work will not proceed until after the condition has been evaluated and the appropriate remedial actions have been taken.

6.7.1.2 ES&H Self-Assessment Programs Are Defined

- 1) The purpose of the Laboratory's ES&H self-assessment program is to ensure a proactive approach to ES&H and to improve ES&H performance. The specific objectives of LBNL's ES&H self-assessment program are to ensure that (a) Laboratory operations comply with applicable ES&H policies and procedures; (b) ES&H-related requirements are integrated into all levels of facility, management, and operational activities; and (c) ES&H-related deficiencies are identified, analyzed, and managed to minimize their occurrence or recurrence.
- 2) The Laboratory's self-assessment program has three legs. Peer Reviews of each division are conducted by the institutional Safety Advisory Committee (SAC) on a nominal three-year cycle. ES&H Program Self-assessments (PSAs) are conducted by EH&S Division SMEs to evaluate the performance of individual ES&H programs (e.g. Chemical Hygiene) across divisions. Division self-assessments are conducted by division staff to evaluate implementation of all ES&H programs needed to control hazards within a given division.
- 3) Each division is to develop and operate an ES&H self-assessment program consistent with the requirements specified in the *ES&H Manual*, and the *Division Self-Assessment Manual* (PUB-3105). As an integral part of the ES&H self-assessment process, each division is to perform an annual evaluation of its implementation of the LBNL ISMS. The evaluation is to include a review of the division-specific ISM *Implementation Plan* to ensure it remains

workable and current, and in conformance with this *Management Plan*. Appropriate workers and other key staff should be involved in the self-assessment.

- 4) The Office of Contractor Assurance conducts independent oversight of the three legs of the Laboratory's self-assessment activities as described in *EHS Assurance Systems Manual* (PUB-5344).

6.7.1.3 Processes Are in Place to Measure and Reinforce ES&H Requirements and Expectations

- 1) Contract 31 establishes strategic performance objectives and measures as described in Section 9.2. Each performance objective and measure is assigned to a specific division that is responsible for providing the required information and tracking the status of performance. The Office of Contractor Assurance (OCA) administers this process.
- 2) The ES&H performance measures process is managed at an institutional level. The SAC has a key advisory role in facilitating the ES&H performance measures process and integrating it into each division's ES&H performance metrics.
- 3) ES&H performance measure information is accessible to all employees.
- 4) Each division is responsible for having appropriate metrics to evaluate its ES&H performance.

6.7.1.4 Processes Are Defined for Analyzing Problems, Identifying Root Causes, and Ensuring Corrective Actions Are Taken

- 1) Each division is responsible for analyzing, tracking, trending, and correcting ES&H-related problems and deficiencies associated with its operations and facilities by using the Corrective Action Tracking System (CATS).
- 2) Each division is to record and track ES&H-related deficiencies in CATS consistent with the provisions and thresholds specified in the *ES&H Manual*. Each division is responsible for correcting deficiencies from requirements, as described in the *ES&H Manual*.
- 3) Each division is responsible for reporting, analyzing, tracking, and correcting ES&H-related occurrences consistent with the Laboratory's implementing procedure for occurrence reporting.
- 4) Serious ES&H-related incidents are to be formally reviewed, addressed, and reported as consistent with the provisions of the *ES&H Manual*. For incidents involving radiological facilities and activities, the Radiation Protection Group and OCA are to be involved, as appropriate.
- 5) Each division is to use medical surveillance examinations as appropriate to assess impacts of work on employee health.
- 6) Causal analyses are to be performed for occurrences, formal incident analyses, and other ES&H-related issues the division deems appropriate.

- 7) Senior management will include the use of CATS to identify, track, and resolve institutional cross-cutting issues that require senior management attention.

6.7.1.5 An Annual Assessment of LBNL's ISMS Is Conducted

The OCA prepares an annual report on the implementation of this *Management Plan*. This report summarizes results and details significant findings identified through the division's ES&H self-assessment activities.

- 1) The OCA is to periodically assess continued implementation of ISMS, both institutionally and at the division level. This is accomplished, in part, by review and roll-up of the division annual evaluations of ISMS implementation specified in Section 6.7.1.2.
- 2) Assessments of division implementation of ISMS will include division-specific documentation and actions as required by this document (e.g., Section 6.7.1.4) and the *ES&H Manual*.
- 3) The OCA will transmit the results of these assessments to the affected division directors and the Deputy Chief Operating Officer (COO) and COO for their information and any action that may be required.

6.7.1.6 Lessons Learned Are Effectively Transmitted

- 1) The Laboratory's Lessons Learned Coordinator gathers information regarding potential Lessons Learned from internal and external sources based on experiences considered relevant to Laboratory operations. Potential Lessons Learned are reviewed by several organizations within the Laboratory associated with ES&H activities, including members of the SAC, before being distributed.
- 2) Lessons Learned are to be shared to enhance operational ES&H and facilitate cost effectiveness. Individuals are to be encouraged to submit Lessons Learned.
- 3) Lessons Learned are to be prepared and distributed whenever there is an opportunity to share a valuable new work practice or warn others of an adverse practice, experience, or product.
- 4) The Lessons Learned Coordinator transmits Lessons Learned to individuals identified by each division's safety coordinator. In addition, each division safety coordinator is responsible for ensuring transmission of Lessons Learned to other appropriate personnel.
- 5) Lessons Learned will be posted on the internal LBNL Web site.
- 6) The authorizing organization is responsible for ensuring that applicable Lessons Learned maintained on LBNL's internal Web site are considered during the process of authorizing work.
- 7) A review of Lessons Learned maintained on the internal Web site is to be incorporated into each division's self-assessment program to ensure continued use of relevant Lessons Learned. They are pushed out to workers based on identified hazards and controls in their JHAs.

- 8) As described in LBNL procedures, Lessons Learned are shared with the greater DOE community through DOE's Web site for Lessons Learned.

6.7.1.7 Improvements Are to Be Incorporated into the ISMS Implementing Documents

Based on the information derived from the various performance monitoring and feedback processes, appropriate improvements are to be incorporated into this *Management Plan*, the *ES&H Manual*, division-specific documents, and the EMS Plan as appropriate. The process for revision of this Plan, and the *ES&H Manual*, is described in Section 8.4.

6.8 Conclusion

Unique issues and special cases not articulated in the set of core requirements in this section are to be addressed by the identified management chain and taken to the responsible division director for resolution and then, as necessary, to the Deputy COO and COO.

7.0 Work Planning and Authorization Process

7.1 Introduction

The objective of the work planning and authorization process is to promote safe, environmentally responsible operations by ensuring that the hazards and environmental impacts associated with facility operations and work activities are clearly understood and appropriately managed.

Consistent with the graded approach process, the greater the hazards or significance of the environmental impacts associated with a facility or work activity, the more rigorous the preparation and authorization process required. In some cases, the authorization process will include environmental regulatory agencies. The Laboratory uses facility-based authorizations and has two Safe Work Authorization levels for work activities based on specific hazards, environmental impacts, and thresholds. The two Safe Work Authorization Levels are: Work Commonly Performed by the Public; and Line Management Authorized Work. Line Management Authorized Work has a further subset of Formal Authorized Work, which is usually of higher potential hazard and requires explicit controls [e.g., an Activity Hazard Document (AHD) or Radiological Work Authorization (RWA)].

Work Commonly Performed by the Public includes activities with hazards commonly accepted, which require little or no guidance or training to perform safely. When aligned with the concepts applied by the Procurement organization for subcontractors, the tasks associated with this work are determined to be noncomplex and nonhazardous when performed in a work location having only negligible hazards present (Section 6.2.2.3). It is recognized that skilled members of the public may conduct activities beyond the capabilities of the general populace, such as changing a faulty electrical outlet, or using a toxic and corrosive paint stripper. These types of activities are to be considered as requiring substantial guidance or training to perform, and as such, are not to be considered Work Commonly Performed by the Public.

For all other work tasks, including routine laboratory or shop work and work on equipment containing stored energy, Line Management Authorization must be granted. Authorization is a review and management approval process designed to ensure that procedures, controls, and resources are in place before the work begins. Review of the Job Hazard Analysis (JHA) is a primary example of this authorization.

Facility-based authorizations are independent of Safe Work Authorizations and provide a safety “operating envelope” based on all activities taking place within that facility. They are generally based upon operating permits from government agencies that must be obtained prior to operation of the facility. They define and document the content and particulars of activities allowed to take place within that facility. The Line Management and Formal Work Authorizations are based on the control of work-activity hazards and management of environmental impacts, and are used to define the hazards and environmental impacts, establish the controls, and

authorize a work activity. Line Management and Formal Work Authorizations must address all facility-based authorization constraints and conditions in their authorization process.

The basic functional relationship and the integration between these authorizations is that they ensure that a planned activity is done within the safety envelope authorized for a facility and that clear lines of responsibility are maintained. When used in combination, the structures provide a comprehensive and integrated approach to a formalized ES&H process, and enable consistent application across the Laboratory.

7.2 Facility-Based Authorization Structure

Facility-based authorizations provide safety “operating envelopes” based on all activities taking place within that facility. There are several formats of facility-based authorizations, and they may be initiated at any point, from design and construction through initial startup, operation, renovation, and final demolition, in a facility’s life cycle. The Facilities Division prepares National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) documentation, and the EHS Division prepares other facility-based authorizations (permits), but the operating divisions within the affected facility are responsible for conducting work within the defined safety “operating envelope” specified by the authorization, e.g., within the conditions of the permit. The Facilities Division and the EHS Division function as the line organizations responsible for environmental management, including emissions and waste management, and for providing treatment and management services to the operating divisions. The types of facility-based authorizations include: air emission permits, wastewater discharge permits, Accelerator Safety Envelopes (ASEs), radiological hazards analysis documents, solid/hazardous waste generation/treatment permits, etc. Facility-based authorizations are addressed in detail in the *ES&H Manual*, Chapter 6 Work Process B, Appendix C of Chapter 6, and Chapter 21.2.

As used here, a “facility” means any equipment, structure, system, process, or activity that fulfills a specific purpose. At LBNL, a “facility” for purposes of a facility-based authorization is generally a building, but in some cases the “facility” may be an area within a building but not the whole building. Facility-based authorizations differ from Line Management Authorizations and Formal Authorizations in the following ways:

- Line Management and Formal Authorizations are based on individual activities, whereas a facility-based authorization is a function of some additional aggregate hazard or interaction among multiple operations or is a function of some piece of facility equipment (e.g., a paint spray booth or waste treatment facility).
- The operating division is generally not involved in obtaining or renewing facility-based authorizations; the activity is coordinated by LBNL (Facilities Division for NEPA/CEQA

issues; EHS Division for all others). Accelerator operating permits, such as the ASE and supporting safety analysis documents, however, are usually the responsibility of the operating division.

The need for one or more facility-based authorizations (permits) may be triggered by new programs or facilities, or it may be triggered by changes in existing programs or facilities. Once a facility-based authorization is in place, it must be reviewed periodically to ensure that the actual operations comply with the operating envelope established for that facility. In addition, existing programs and facilities must be reviewed periodically to determine if changes in operations may trigger a new facility-based authorization. Facility-based authorizations are an independent constraint that overlay the Work Activity Authorization structure.

7.3 Work Activity Authorization Structure

All work activities must include attention to ES&H and use of the Integrated Safety Management System in order to address and improve the overall ES&H performance at LBNL. This can be accomplished by using the Work Activity Authorization structure and the different authorization levels described in this section. The structure and levels are connected to the safety hazards through the degree of understanding of the hazards and controls and the documentation that exists or is required for Work Activity Authorization. Consideration of environmental aspects and their impacts is required at all levels. This approach provides a single process for addressing the variety of hazards and environmental impacts at LBNL. In each level, there is a range of hazards and/or environmental impacts that are addressed by the type of controls and documentation cited. When a work activity is beyond those commonly performed by the public, preparation of a JHA is required as described in Section 6.4.1.2.

The JHA process is designed to ensure front-end identification and understanding of an activity's hazards and environmental impacts, and to facilitate the development and implementation of tailored controls and reduction of environmental impacts. A single JHA may be used to cover projects or multiple activities of a similar nature. The JHA ensures a conscious formal process for work where there is no self-authorization allowed. Project participants and, as appropriate, ES&H professionals and subject matter experts are involved in the preparation and authorization process to help ensure attainment of the ISM objectives. Variations of the JHA process have been developed and tailored for construction (c-JHA) and non-construction subcontractors (sJHA).

For certain situations, formal work permits are also necessary as described in the *ES&H Manual*. Examples of these would include AHDs, Laser Safety Documents, RWAs, Biological Use Authorizations (BUAs), Accelerator Safety Documents, and operating permits from regulatory agencies such as the California Department of Toxic Substances Control and the Bay Area Air Quality Management District. The hazard-analysis mechanism is identified for each level in the form of the people required to perform the function. The *ES&H Manual* contains

necessary specifics for the work reviews at each level as well as other information, definitions, and elaboration. Safe Work Authorizations are addressed in detail in the *ES&H Manual* Chapter 6 Work Processes A, B and C, and in Appendices A and B of Chapter 6. This chapter describes two levels of work authorizations: Line Management and Formal.

Line Management Authorization. Work activities beyond those commonly performed by the public and governed by existing ES&H documents are designated as Line Management Authorized work. Such activities require a JHA to ensure proper planning, authorization, and documentation. Appropriate work controls are defined by references to the *ES&H Manual* and other applicable existing ES&H documents. Environmental impacts are identified as applicable, and applicable environmental controls are applied. In cases involving more significant environmental impacts, the Environmental Management System (EMS) Core Team will get involved to fulfill responsibilities defined in the EMS Plan.

Formal Authorization. A Formal Authorization (e.g., AHD, RWA, BUA), is prepared when (a) it is required by provisions of the *ES&H Manual* or (b) it is mandated by management. Authorizations mandated by any regulation would be included within the *ES&H Manual* requirements. This is required whether the work is conducted on site or off site if LBNL has management responsibility. Specific requirements are provided in the *ES&H Manual*, Chapter 6.

Laboratory operations are designed to comply with (1) Contract 31 requirements; (2) LBNL internal policies, procedures, and standards; (3) federal, state, and local regulations; and (4) other ES&H Standards. However, there may be occasions when a specific work activity or facility requires a deviation from these established requirements. In those cases, organizations must request and obtain written authority to deviate from the requirements. This is called an exemption.

8.0 Integration of Program and ES&H Planning

8.1 Introduction

Integration of program and ES&H planning, from the Laboratory Director down to the individual worker, is accomplished following the Institution/Facility/Activity Process using this *Management Plan*, the *Integrated Safety Management (ISM) Improvement Project Plan* process, and the division-specific documents. This *Management Plan* and the *ES&H Manual* incorporate the Integrated Safety Management System (ISMS) fundamentals that are essential to Laboratory operations.

Worker involvement is an essential part of ISM; therefore, an important integration direction is the formalized upward involvement and connection from workers in all of the functions and assignments. This integration needs to be operative upward through the institutional, facility, and activity processes, as well as from the top down. The Laboratory and the divisions must encourage, use, and recognize the suggestions, ideas, and efforts from the workers. Division safety committees are a formalized example of this process. Similarly, because of the LBNL mixed-matrix organizational structure, integrations across divisions and their program, home organization, facility, and services operational functions must also be addressed. These are addressed from the institutional perspective in this *Management Plan*. The necessary specifics for all directions of integration are contained in the division-specific documents or succeeding documents.

Documents that describe the integration of ISMS principles, the management chains important for proper integration, and means of communicating and training for these principles are also addressed in this section.

8.2 Division-Specific Documents

This *Management Plan* includes requirements that must be fulfilled at the division level. For example, each division must document the roles and responsibilities for positions within its organizational structure from the Division Director to the worker. The organizational structure of each division is tailored to meet its unique programmatic mission with different types of facilities, technical work, hazards, and environmental impacts. Additionally, each division has specific requirements for feedback and improvement that must be documented. To establish the flow-down of ISMS requirements from institutional requirements to the working level, each division develops an ISMS *Implementation Plan*. These plans tailor implementation of institutional requirements given in the *ES&H Manual* and this institutional *Management Plan*.

Each division has the freedom to determine the best way to organize its division-specific ISM documentation. It may modify its existing ISM *Implementation Plan* or other existing safety documentation that succeeded the *Implementation Plan*, or create new documents. It is each division's responsibility to ensure that all required documents are prepared and shared with

division staff, as appropriate. Each division director is responsible for approving the ISM documentation and for the maintenance and configuration control of the division's ISMS implementation documents. Elements that must be addressed in each division ISM *Implementation Plan* are found in Appendix A. Elements required in division ISM *Implementation Plans* include: the purpose of the plan; ES&H roles, responsibilities, and accountability at all levels of the division, as well as for subcontracted workers, matrixed employees and students; as applicable, work on the UC campus, and other off-site locations; work authorizations; performance monitoring and feedback, the division self-assessment plan, injury and illness reporting tracking and analysis; investigations; communications of Lessons Learned; qualifications and training; and reporting employee concerns.

8.3 Environment, Safety & Health Manual (PUB-3000)

The LBNL *Environment, Safety and Health Manual (ES&H Manual, PUB-3000)* defines Laboratory safety policies and provides for their implementation as specified by the Environment, Safety and Health section of the LBNL *Requirements and Policies Manual (RPM, PUB-201)*. *ES&H Manual* development is also required for implementation of the DOE ISM program described in this *Management Plan*.

The requirements in the *ES&H Manual* are based on the ES&H Standards Set contained in Contract 31. The ES&H Standards Set is identified for the specific work and associated hazards, environmental impacts, and best-management practices that have been determined to be LBNL requirements. The *ES&H Manual* also describes the implementation of the ES&H management commitments made in this *Management Plan*.

The EHS Division Director is responsible for developing, maintaining, publishing, and supporting the implementation of the *ES&H Manual* and its supporting documents. An *ES&H Manual* Manager is designated to coordinate administration of the document and its updates. The *ES&H Manual* is organized by chapters that address specific technical or administrative ES&H subject areas, and each chapter has a responsible author who usually is a subject matter expert (SME) for the material covered by the chapter. Some chapters address multiple subjects, in which case the responsible author serves as an editor for multiple SMEs who contribute to the chapter's technical contents. The chapter responsible authors and SMEs are responsible for keeping the content of their chapters current. The chapter responsible authors are responsible for creating or using mechanisms that involve appropriate workers in the development and maintenance of compliant and effective safety programs (chapters). An example of mechanisms that support worker involvement would be using members of safety committees, such as the Electrical Safety Committee or the Institutional Biosafety Committee. Other mechanisms could include soliciting appropriate worker participation during safety meetings, etc.

The LBNL Safety Advisory Committee (SAC) makes recommendations to the Environment /Health /Safety /Security (EHS) Division Director on the development and implementation of Environment, Safety, and Health (ES&H) policy, guidelines, codes, and regulatory interpretation. It conducts reviews of special safety problems, and provides recommendations for possible

solutions to the Laboratory Director, Associate Laboratory Director for Operations (ALDO)/Chief Operating Officer (COO), and/or the EHS Division Director as requested. The SAC also provides advice and counsel to the ALDO/COO by reviewing appeals from Laboratory divisions when any division and the EHS Division do not agree on the interpretation or application of criteria, rules, or procedures. Such advice and counsel may include options for a resolution.

The following controlling principles for the *ES&H Manual* outline the basic requirements for the use, maintenance, and availability of the *ES&H Manual*.

- LBNL conducts work in accordance with the *ES&H Manual*.
- The EHS Division Director develops and maintains the *ES&H Manual* through SMEs and Laboratory Director-appointed committees, such as the SAC.
- The use of the *ES&H Manual* is supplemented by SMEs and the EHS Division liaisons who assist in the interpretation and implementation of the applicable requirements. The EHS Division Director is responsible for maintaining both the SMEs and the EHS Division liaisons for all of the broadly applicable topics.
- LBNL will update the *ES&H Manual* on an ongoing basis through the SMEs and the Laboratory Director-appointed committees to ensure incorporation of requirements in the ES&H Standards Set in Contract 31.
- LBNL addresses the technical accuracy, efficacy, and completeness of the *ES&H Manual* on a continuing basis. The review schedule for the *ES&H Manual* is developed and maintained by the *ES&H Manual* Manager with inputs from the SMEs and Laboratory Director-appointed committees.
- The electronic copy of the *ES&H Manual*, available through the LBNL Web site, is considered the official and current copy. All users are required to ensure they are working from this copy. Editable Microsoft Word files of PUB-3000 chapters are available for responsible authors and SMEs.
- LBNL collects ES&H Lessons Learned and makes this information available to the Laboratory community. The Office of Contractor Assurance coordinates this effort and addresses Lessons Learned that can be used to improve the *ES&H Manual*.
- Any exceptions to the requirements in the ES&H Standards Set will be addressed in a formal process commensurate with the hazards or environmental impacts involved, with any resulting fundamental changes addressed accordingly.
- The *ES&H Manual* Manager maintains the *ES&H Manual* under a configuration management process to ensure that control is maintained during the development, revision, and communication of requirements from the ES&H Standards Set to the end users.

With these basic requirements, the EHS Division Director, SMEs, and Laboratory Director-appointed committees will continue to conduct the necessary multifaceted and detailed process to incorporate ISM and the ES&H Standards Set into the *ES&H Manual*. The incorporation process used for the ES&H Standards Set is described in Section 12, *Flow-Down of Requirements*.

8.4 ISMS Management Plan

This ISMS *Management Plan* (PUB-3140) is developed and vetted using the same process and procedure as is used for management of the *ES&H Manual*, except that it receives approval from the Department of Energy Office of Science (DOE SC) Berkeley Site Office (BSO) Site Manager. The EHS Division Director assigns a publication manager who develops and maintains PUB-3140 through SMEs and Laboratory Director-appointed committees, such as the SAC. It is reviewed annually and approved by the Laboratory Director, the EHS Division Director, and the BSO Manager. The process is found in the *ES&H Manual* Chapter 1, Work Process A.

8.5 Management Chain

The important management chain for each work activity, from the worker and the first-level supervisor up through the responsible division director, is defined in Section 6.2.2.2. This includes a description and a basic framework of the operational functions, which provide an extension and clarification of the overall structure for the LBNL mixed-matrix organization. With these, a vertically integrated management chain exists for all LBNL operations so that the ES&H responsibility accompanies the funding chain.

8.6 Integration across the Laboratory

Another important element of ES&H integration is the horizontal integration across the divisions and the organizations within them. Horizontal integration is especially critical in achieving consistency in the implementation and use of ISM in all LBNL activities. It is also useful in the relationships with the other DOE organizations and particularly where they are working together.

Horizontal integration operates within many mechanisms at LBNL. The process starts with the Laboratory Director, Laboratory Deputy Director, the Chief Operating Officer, and the associate Laboratory directors (ALDs), and is achieved at their meetings and in their interactions together and individually. Next is the senior leadership, which includes the Laboratory Director, the Laboratory Deputy Director, the Chief Operating Officer, ALDs, division directors, and other top-level managers with broad institutional responsibilities.

The Laboratory Director-appointed committees, especially the SAC, assist with the critical function of horizontal integration. The established processes for these committees are particularly valuable in addressing the institution-wide issues, actions, and needs.

This *Management Plan*, the *ISM Improvement Project Plan*, PUB-3000, and other ES&H documents are additional major factors in horizontal integration. The availability of these on the LBNL Web site as well as the growing number of computerized aids for filling out forms, making evaluations, and reporting greatly increase the horizontal integration and the attendant values. Other entities across the Laboratory that contribute to horizontal integration include:

- Division safety coordinators and EHS Division liaisons and their meetings and interactions.
- Procurement and Property Management connections with the division buyers.
- Structures within divisions, like Engineering and Computational Research, that provide matrix support to many parts of the Laboratory.

The regular meetings of the senior managers are commonly used for ES&H topics and are important in the horizontal integration.

Horizontal integration is greatly assisted by the communications and training addressed in the next section. The Laboratory-wide communications program and the institutional training courses help ensure that the ISM messages are consistent and clear.

8.7 Communications and Training

ISM communications and training have the long-term goal of helping to continually improve the Laboratory's ES&H culture. The strategy is to position the concept of "workplace ES&H" alongside those of "scientific excellence" and "quality work" in everyday Laboratory life. This is being done by presenting the subject (and key messages) of ES&H frequently, using a variety of media, making sure employees have appropriate training, and involving employees in identifying and solving ES&H problems.

When possible, institutional safety communications are aligned with the vision of the [*Strategic Plan for Safety Culture Improvement at LBNL*](#). The LBNL Safety Culture Work Group implements strategic communication initiatives identified in the Plan for promoting and recognizing safe behavior. One example is an interactive website dedicated to the advancement of LBNL safety culture. Top-down messaging from senior management is balanced with safety issues and accomplishments at the grassroots level.

In order to optimize the effectiveness of ES&H communications, the size and characteristics of the target audience — Individual, Group, and Institution — are important considerations. An example of an individual communication is an employee meeting with his/her supervisor to discuss safety in the workplace. Group communications include new employee orientations, safety committee meetings, presentations, and focused emails. Institutional communications include level-1 emails, articles in *Today at Berkeley Lab* (TABL), Safety Culture website articles, poster campaigns, and 1 Minute 4 Safety slides.

ES&H communications, including training, are a continuing effort, although the tone and emphasis on specific topics will change depending on current issues, employee input, and program actions. Integral to the program is management leadership, personalized messages, continuity of effort, consistency of discussion, and capitalization of employee values, such as people's pride in the organization, their loyalty, and dedication to excellent work.

Planned communications are designed to avoid overwhelming employees with messages concerning ES&H. The sustained effort will create the expectation that ES&H is part of everyday work discussions. These discussions will be enlivened by new topics presented periodically and by revisiting others as needed.

Many different communication tools and approaches are being used to engage employees at all levels. Planning includes campaigns to promote awareness of specific concerns such as eye protection or pollution prevention, expanded development and communication of Lessons Learned, promotion of the online *ES&H Manual*, communications guidance for supervisors, computer-based information sources, and special events. Feedback mechanisms will be used to identify problems and successes, and then to share information with the Laboratory community as ISM continues to mature.

Repetition of message. The objective here is to ingrain the subject of ES&H into the mindsets of employees, including subcontractors as they carry out the Laboratory's mission. Employee awareness of ES&H begins with senior management meetings that discuss the issue and encourage how it can be communicated throughout the many levels of the organization. *Today at Berkeley Lab* and the ESSH division website have an important role in awareness efforts. They regularly cover topics such as ISM successes, Lessons Learned, updates on the LBNL ES&H record, ES&H awards, and programs to hold employees accountable for following ES&H requirements. Other activities include:

- Periodic focus groups which allow management to hear directly from employees about ISM issues, and to demonstrate sustained interest in the maturing and continual improvement of the ISM processes;
- Monthly topical communications regarding both work-related and off-hours ES&H concerns. Communications planned on work-related topics that include slips, trips, and falls; safe handling of poisonous materials; electrical safety; building safety; ergonomics; and protection of the environment.
- Development of resources to improve ES&H communications between first-line supervisors and employees. This includes specialized training, and Web-based and printed information.

Promotion of off-the-job ES&H. Excellent ES&H programs nationwide also promote off-hours ES&H. The Laboratory will emphasize off-the-job ES&H during many of its monthly promotions discussing topics like poison prevention, bicycle safety, preventing sports injuries, environmental awareness, safe driving, fire safety, and special precautions to be taken during the winter and

holiday season. Environmental awareness includes conservation of natural resources like energy and water; prevention of pollution; protection of air, soil, water, and wildlife; and generation and minimization of solid and hazardous wastes.

Media used to promote off-the-job ES&H includes posters, instructional flyers, videos, signs and banners, and activities such as demonstrations, speakers, and periodic safety fairs.

Participation of senior management. The vigorous participation and vocal endorsement of senior management is critical to the success of ES&H communications programs, as evidenced by experiences at other sites and comments made by Laboratory employees. Examples of management activities conducted are walk-around programs, writing Director's Office columns for *TABL* and having division directors sponsor division-led ES&H promotions. Another important element is educating managers to the proper use of LBNL's case-management program.

Ongoing training. Relevant employee training has been incorporated into the existing training structure. This will ensure that new employees receive ISM training, and that those moving from one division to another will receive specific training as appropriate. In addition, proper use of the Job Hazard Analysis ensures that employees receive training needed for specific work assignments.

Reviewing the training needs of specific employee populations is another important ongoing activity.

New curricula are being used as they are developed and approved.

Employee involvement. This involves encouraging employees to participate in identifying ES&H problems and developing solutions, such as revising policy or procedures, rather than management attempting this entirely on its own. Examples of activities being used to encourage involvement include employee participation in the development of Laboratory policies and procedures, employee participation in key Laboratory safety committees such as the Safety Advisory Committee, and employee participation in continuous improvement activities such as incident investigations and division self-assessments and process improvement teams.

8.8 Division ES&H (Safety) Committees

Each division will maintain an ES&H (safety) committee, consisting of a chair representing the division director/department head, one representative from each research group, and the EHS Division liaison. The ES&H committee's duties are to:

- Review, maintain, and implement the ISM plan;
- Analyze Supervisor Accident Analysis Reporting (SAAR) injury and illness data;
- Promote ES&H awareness and training in environment, safety, and health topics;
- Review the need for specialized training;
- Provide for and/or conduct routine inspections and self-assessments;
- Participate in planning for the triennial Peer Review of the division ES&H program;

- Develop metrics and analyze pertinent safety performance data;
- Advise division management on ES&H issues.

The ES&H committee will prepare an annual self-assessment report for the division director that includes an evaluation of how well this division ES&H plan is implemented. The ES&H committee also will ensure that the division works to improve the effectiveness of the division ES&H program through the dissemination of Lessons Learned and other appropriate feedback mechanisms.

9.0 Program and Budget Execution Guidance

9.1 Internal Process

Laboratory management is responsible for planning work and for ensuring that the Integrated Safeguards and Security Management System requirements for working safely while minimizing environmental impacts are incorporated into all activities, and are addressed in the prioritization and allocation of resources. ES&H is a primary consideration in planning and executing all work activities.

There are four primary ways ES&H and related functions are funded at LBNL:

- 1) Indirect Budget Call [General and Administrative (G&A) for institutional activities]
- 2) Unified Project Call Process (line item, general plant projects, and capital equipment projects)
- 3) Service centers (institutionally approved and recharged to users)
- 4) Direct programmatic funds

Indirect Budget Call. Budget requests for institutional EH&S Division functions are funded through the Indirect Budget Call. These requests cover institutional EHS Division activities such as waste management, radiation exposure, industrial hygiene, dosimetry, ES&H standards and policies, monitoring, and site-wide environmental permitting. Budget submissions through the Indirect Budget Call are categorized into three types: Target, Over Target, and Investment. In addition, budgets are categorized as either Base or Non-Base budgets. Base budgets are defined as ongoing activities that have no specific end. Non-Base budgets include those activities with an end date and are not ongoing in nature. All budget items are characterized as Base or Non-Base.

Target budgets capture the most important, ongoing operations costs. All costs within this category are assumed to be Base. Over-Target budgets are requests in excess of the Target Budget. These are designed for either new requirements or activities deemed of such an important nature as to be included for incremental consideration, or that their exclusion would have a negative impact. With the possible exception of new requirements, Over-Target requests are prioritized after Target budget activities. Investment budget requests are incremental requests, which are justified by the future financial benefit received from the expenditure. The benefit received can be achieved in future years and must be quantifiable, demonstrable, and not solely for cost avoidance. The institutional justification for these types of requests is future financial savings in excess of costs incurred. The savings could be achieved either within the requesting division's budget, within other institutional budgets, or within the costs charged directly to scientific programs. Lastly, fenced budget items are defined as items where there is little or no discretion on cost levels, such as Fire Department costs.

Institutional Budget Activities (IBAs) are defined as a grouping of costs usually around departments that are consistent with the organization's organization chart. IBAs represent a logical breakout and accumulation point within a department that represents how these activities

are managed and how the activities can be communicated to others. The department heads are responsible for developing and prioritizing budget requests, which are then reviewed by the EH&S Division Director prior to submittal. All proposed budgets are presented to and reviewed by the Chief Operating Officer.

Unified Project Call. Berkeley Lab's Unified Project Call Process provides programmatic and infrastructure organizations the opportunity to examine their operational needs and to submit prioritized candidate Line Item Project, General Plant Project, Non-Capital Alteration, and General Purpose Equipment proposals in the budget process. It serves as a vehicle for implementation of the Laboratory's mission as expressed by Laboratory management and documented in Berkeley Lab's Ten-Year Site Plan and [Institutional Plan](#), and facilitates Laboratory-wide coordination of divisional project proposals, Corrective Action Tracking System (CATS) project proposals, and Laboratory infrastructure improvement and expansion project proposals. Lastly, it identifies sources of funding to adapt facilities to new or improved production techniques; effect economies of operations; and reduce or eliminate safety, health, fire, environment, and security problems.

Service Centers. These centers are established where direct funding is not practical and activities can be charged to users based on usage or some other measure. Institutional service-center examples include site-maintenance costs distributed through the Laboratory facility charge, and procurement costs distributed through the material procurement burdens. The institutional service center budgets are reviewed in a manner similar to the Indirect Budget Call. Division directors are responsible for the general and financial management of service centers in their areas.

Direct Programmatic Funds. In the direct program area, management, from the Laboratory Director down, is responsible for establishing the priorities of the work. Division directors delegate ES&H authority to managers in their organization; however, division directors remain accountable to the Laboratory Director for ensuring that ES&H activities are performed according to LBNL requirements. The EH&S Division provides the necessary ES&H expertise, guidance, and services to assist division directors and their management chains in meeting ES&H requirements.

The remaining non-G&A-funded activity within the EH&S Division is the Safeguards and Security Program. The LBNL Safeguards and Security Program is a direct-funded program that employs a risk-based approach to providing cost-effective security for the Laboratory. The purpose of the program is to provide an appropriate level of security to protect employees, equipment, and property at the sites both on and off the main LBNL facility site. Through strategic planning and cost-benefit analysis, the Laboratory determines strategies to provide security services that add value to the scientific programs.

9.2 Performance Objectives and Performance Measures

The University of California (UC) is under contract to the DOE to LBNL. Clause H.14 of Contract DE-AC02-05CH11231 requires that UC "utilize a comprehensive approach for overall

Laboratory management. The performance-based management approach will include the use of objective performance goals and indicators, agreed to in advance of each performance evaluation period, as standards against which the Contractor's overall performance of the scientific and technical mission obligations under this contract will be assessed."

The Performance Evaluation and Measurement Plan (PEMP) serves as DOE's primary basis for review of the contractor's performance relative to high-priority outcomes tied to awarding incentive fee and contract term extension. Correspondingly, the PEMP is an important planning tool because it expresses high priority initiatives in science, management, and operations that LBNL will pursue in a particular fiscal year rating period.

The PEMP provides a standard used to determine whether LBNL is satisfactorily managing and operating the Laboratory and is meeting the mission requirements and performance expectations/objectives of DOE as stipulated within the contract. The appraisal process institutes a common structure and scoring system across all of the Office of Science laboratories. Structured around eight performance goals, the appraisal process emphasizes the importance of delivering the science and technology necessary to meet the missions of DOE; of operating the Laboratory in a safe, secure, responsible, and cost-effective way; and of assessing the leadership, stewardship, and value provided by the senior leadership of LBNL and UC. Input is solicited from all the major sponsors of work at LBNL.

Performance relative to Goal 5: "Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health and Environmental Protection," Is reviewed every tri-mester during the fiscal year with UC and the DOE Berkeley Site Office. Reports from these reviews are used by the BSO to evaluate the performance of the Laboratory at the end of the fiscal year in the annual DOE Performance Evaluation Report.

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10.0 Standards and Requirements

10.1 Contract 31 Requirements

Contract 31 stands as the fundamental basis for the operations of the Laboratory. The Contract's current official language and provisions provide the legal basis for all activities. Clause I.79-DEAR 970.5204-2, *Laws, Regulations, and DOE Directives* (December 2000) (*Deviation*), taken from 48CFR970.5204-78 and effective October 1997, contains the fundamental operative statement in (a):

"In performing work under this Contract, the Contractor shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), unless relief has been granted in writing by the appropriate regulatory agency. A List of Applicable Laws and Regulations (Appendix I/List A) may be appended to this contract for information purposes. Omission of any applicable law or regulation from Appendix I/List A does not affect the obligation of the contractor to comply with such law or regulation pursuant to this paragraph."

The ES&H Standards Set in Contract 31 provides the ES&H requirements for LBNL as of May 2013. These, along with the ongoing actions on noncontract standards and practice, are being incorporated through an established LBNL process into the *ES&H Manual* and other operating documentation (see Section 12.2). Contract 31 contains in Clauses I.79 and I.86 the language providing for ES&H Standards and Integrated Safety Management (ISM), respectively, and their incorporation upon completion, as described in other sections of this *Management Plan*.

10.2 ES&H Standards

In November 2008, the Berkeley Site Office (BSO) Contracting Officer determined that the existing process for necessary and sufficient standards under Clause I.86, commonly known as the Work Smart Standards, had not been a timely mechanism for updating requirements into Contract 31. In lieu of that process, the BSO Contracting Officer required use of the process outlined in Clause H.18 for all DOE directives, including those applicable to the environment, safety, and health (ES&H). Recognizing that there was value in maintaining the ES&H requirements separately from the rest of Appendix I directives, the list was renamed the *Environment, Safety and Health Standards for LBNL*. Since "necessary" and "sufficient" standards would no longer have their prior connotations, the two lists were collapsed into a single list of standards. DOE Directive DOE M 450.3-1, *The Department of Energy Closure Process for Necessary and Sufficient Sets of Standards*, was removed from the contract.

The ES&H Standards Set is important as an input to the Integrated Safety Management System (ISMS) and as a key operational component for developing controls. It also fulfills Guiding Principle 5: Identification of Safety Standards and Requirements, in a conscious, organized, and broadly reviewed manner. The evaluation of work at the facility and activity levels, as described in Sections 6 and 7 of this *Management Plan*, uses the ES&H Standards Set. Establishing the ES&H Standards Set while the ISMS *Management Plan* was in preparation allowed the

appropriate connections to be made and aligned with current thinking and needs. In the relationship between ES&H Standards and ISMS, the ES&H Standards Set provides the general and specific requirements tailored to LBNL activities, and the ISMS establishes the structure and implementation mechanisms for using the ES&H Standards Set as the basis for performing work safely while minimizing environmental impacts.

With these contractual obligations and the DOE Policy and supporting documents, the Laboratory and DOE Office of Science (SC) Berkeley Site Office (BSO) initiated the process in May 1997 to select an ES&H Standards Set applicable to the work at LBNL. The process was formal, with structured elements and accompanying documentation. A convened group, which is the process steering committee with members from LBNL, the University of California (UC), and DOE BSO, was established to manage and support the successful completion of the process and selection of the ES&H Standards Set. ES&H professionals from LBNL, DOE BSO, UC, and other DOE sites working with Laboratory program, facilities, and operations personnel obtained a comprehensive understanding of the work and hazards, including environmental impacts, and established the appropriate set of standards that when implemented provide adequate protection to the workers, the public, and the environment. All personnel involved were selected individually by the convened group upon review of credentials against established participation criteria. All participants were trained to the DOE-approved training modules.

The ES&H Standards Change Management Process, using a team approach, focuses on the work and its associated hazards and environmental impacts to select those standards that provide the appropriate level of safety and environmental protection. For LBNL, the work and associated hazards and environmental impacts were identified for a carefully chosen set of representative facilities. Based on this information and extensive knowledge of ES&H Standards, the Standards Identification Team selected the appropriate standards that collectively apply to the institution. These standards were reviewed internally and confirmed to be appropriate and feasible by an outside independent team of ES&H experts. With the satisfactory completion of the confirmation step in March 1999, the ES&H Standards Set was forwarded to the approval authorities, the LBNL Director, and the DOE BSO Manager; was signed August 1999; and was incorporated into Contract 31.

10.3 Maintenance of ES&H Standards

As changes occur, there will be new knowledge, technologies, and issues, along with new laws, regulations, and standards. Consequently, the ES&H Standards Set in Contract 31 must be reviewed and updated periodically, using a formal process. The formal Change Management Process for the ES&H Standards is incorporated into the LBNL Requirements Management Policy, found in the on-line *Requirements and Policies Manual*. The Change Management Process provides an important opportunity to keep the ES&H Standards Set up to date and includes provisions for addressing new and special situations that might arise.

This process has resulted in revisions to the ES&H Standards Set, such as in 2007, when the set was revised to include 10CFR851, *DOE Worker Safety & Health Program*. Another major

refinement was conducted in 2010 during the Contract 31 Requirements Review Initiative Pilot Project.

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11.0 Evaluating and Resolving Noncompliances

11.1 Requirements

Under the provisions of Contract 31, the Laboratory and the University of California Office of the President conduct an annual institutional-level self-assessment to evaluate management performance in a number of administrative and operational areas, including ES&H. This self-assessment is made against a set of performance goals, objectives, measures, and targets (see Section 9.2). Department of Energy Berkeley Site Office (DOE BSO) reviews and verifies the self-assessment report and the Laboratory's performance.

Annual institutional-level self-assessment, Office of Contractor Assurance evaluations, and other special reviews are accompanied by DOE BSO management through appraisals of the Laboratory, which include several ES&H areas.

In addition to the institutional assessments, LBNL has a well-developed, ongoing self-assessment program that is specified in the *ES&H Manual* and the ES&H Assurance Plan (PUB-5344). These Laboratory organization self-assessments evaluate the effectiveness of adherence to ES&H requirements and implemented controls at both the facility and activity levels.

The formal self-assessments of the Laboratory provide the status at a particular time. Also important are the wide variety of ongoing multifaceted review processes conducted by LBNL personnel that provide timely information on and insight into the status and performance at each level within the Laboratory.

11.2 Issues Management Program

The Lawrence Berkeley National Laboratory (LBNL) Issues Management Program (IMP), described in PUB-5519(1), encompasses the continuous monitoring of work programs, performance, and safety to promptly identify issues to determine their risk and significance, their causes, and to identify and effectively implement corrective actions to ensure successful resolution and prevent the same or similar problems from occurring

This comprehensive institutional program is comprised of four Program Manuals, two databases and two implementing procedures. These tools define and implement the process for issues identification, tracking, resolution, closure, validation, and effectiveness of corrective actions. Issues that are governed by this program include program and performance deficiencies or nonconformances that may be identified through employee discovery, internal or external oversight assessment findings, suggested process improvements and associated actions that require formal corrective action. Issues may also

be identified in and/or may result in Root Cause Analysis (RCA) reports, Price Anderson Amendment Act (PAAA) reports, [Occurrence Reporting and Processing System \(ORPS\) reports](#), Accident Investigation reports, assessment reports, and External Oversight reports.

Analysis of issues, individually and collectively, is performed in order to identify programmatic or system issues and to identify recurrence of issues, generic issues, trends, and vulnerabilities at a lower level before significant problems result. Issues are evaluated following the [Principles for Conducting Incident/Event Analyses at LBNL](#).

Lessons Learned and Best Practices, based on LBNL's and other facilities' operating experiences, are developed to ensure ongoing improvement of safety and reliability, prevent the recurrence of significant adverse events/trends, and determine implementation strategies that will help LBNL successfully meet the missions and goals set forth by the Department of Energy.

The program manuals and tools are listed below.

1. LBNL/PUB-5519 (1), [Issues Management Program Manual](#), Rev. 5
 - Corrective Action Tracking System (CATS) Database
 - OIA-OCA-0001, [CATS Database User Manual](#), Rev. 3
2. LBNL/PUB-5519 (2), [Causal Analysis Program Manual](#), Rev. 5
3. LBNL/PUB-5519 (3), [Data Monitoring and Analysis Program Manual](#), Rev. 0
4. LBNL/PUB-5519 (4), [Lessons Learned and Best Practices Program Manual](#), Rev. 1
 - Lessons Learned and Best Practices Database
 - OIA-OCA-0002, [Lessons Learned/Best Practices Database User Manual](#), Rev. 0

11.3 Corrective Action Tracking System (CATS)

The Laboratory has implemented a Web-based system to track assessments and corrective actions, regardless of the discovery method. The system is known as CATS. It serves as the means for LBNL management and employees to document, manage, track and close issues and their associated corrective actions. The system also serves as a data warehouse for issues management information and is designed with reporting capabilities so that the data may be used to gauge implementation and effectiveness of corrective actions, and to monitor and trend adverse conditions. Each division enters and maintains its deficiencies and issues in the CATS database. The system is administered by the Office of Contractor Assurance.

12.0 Flow-Down of Requirements

12.1 Basics

The LBNL institutional ES&H requirements apply to the entire Laboratory workforce. These are contained in the ES&H Standards Set in Contract 31. The LBNL ES&H Core Policy posted in the *Requirements and Policy Manual* (RPM, PUB-201) specifies implementation of these requirements through the Integrated Safety Management System (ISMS) process and through the *ES&H Manual*. The ISMS provides the process to connect the ES&H Standards Set to the work, implement it, and to conduct work safely while providing responsible environmental stewardship. By executing work in accordance with the controls developed from the ES&H Standards Set through the *ES&H Manual* requirements, the workforce, the public, and the environment are adequately protected.

The LBNL ISMS process incorporates the tailoring of requirements in addressing mission needs, plus the hazards and environmental impacts associated with them. As the range and scope of work activities change, the associated controls, including regulations and standards, are adjusted accordingly. This *Management Plan* and the *ES&H Manual* provide the institutional approach for integrating ES&H requirements into the processes of planning and conducting work and are the basis for alignment and content of the lower-level ES&H documents. The ISMS becomes more detailed and specific in the lower-level documents that provide the organizational structures (divisions, groups, and departments) and operational processes.

Laboratory operations are addressed through ES&H management processes and controls contained in the *ES&H Manual* and other documents. These processes include management direction for planning and conducting work activities, and facility management for work performed on the LBNL sites, as well as for work performed by LBNL personnel at other locations.

The *ES&H Manual* and other institutional-level documents establish the processes to be used by Laboratory programs and organizations, facilities, and the Laboratory workforce. These documents include formal processes, including configuration management, used throughout the Laboratory for applying and establishing institutional-level requirements and practices locally at the facility and activity levels.

As hazards or environmental impacts increase, so do the formality, intensity, and redundancy of controls and assurance measures. Laboratory manuals and institutional documents define the explicit institutional consistency for formality of planning, documentation of process activities, record keeping, the level of independence of people involved in their review, and confirmation of adequacy needed for establishing facility- and activity-specific expectations. They allow the established requirements to be appropriately tailored to meet specific needs of facilities and activities while covering a wide range of work and the associated hazards and environmental impacts. These manuals and other institutional-level documents also establish Laboratory requirements for other areas of ES&H management that involve the development and tracking of

corrective actions, such as occurrence reporting, accident analyses, and self-assessment and improvement processes. Similarly, they establish technical requirements and often prescribe explicit administrative and engineered controls for specific hazards. The required controls are mandatory anywhere throughout the Laboratory where the work activity manifests similar hazards.

12.2 The ES&H Manual Process

The process for establishing LBNL's ES&H requirements involves three key steps:

- 1) Development of the ES&H Standards Set to accommodate changes in the range and scope of LBNL work and incorporation of the set into Contract 31 (see Section 10).
- 2) Identifying new and changing laws and regulations, Contract 31 requirements, and UC policies as applicable to current and new work at LBNL. This is accomplished by the ES&H Standards Change Management Process.
- 3) Incorporation of the appropriate requirements from the ES&H Standards Set into the *ES&H Manual*.

The overall process is described in the following subsections and is shown in Figure 12.1.

12.2.1 Identification of Requirements

LBNL's ES&H requirements are derived from numerous sources, but come primarily from federal, State of California, regional, and local statutes, regulations, and ordinances; DOE directives; national consensus standards; and University of California (UC) policies. The range and scope of work at LBNL is dynamic, as are the regulatory and contractual requirements. As both change, the ES&H Standards Set is adjusted. These are all included in the LBNL ES&H Standards Set and incorporated into Contract 31 as described in Section 10.

LBNL relies primarily on the professional staff in its institutionally managed EH&S Division staff, the Office of Contractor Assurance, and the Office of the Laboratory Counsel to monitor for new and changing regulations and DOE directives that pertain to the work, its associated hazards, and environmental impacts at LBNL, and the standards in the ES&H Standards Set. LBNL interacts with regulatory agencies, UC, and DOE staff through meetings and site visits. The Laboratory also makes heavy use of modern communications systems as part of its information resources. When requested, ES&H experts and programmatic personnel review and comment on proposed revisions to existing DOE directives, new directives, and proposed rules.

12.2.2 Evaluation of Requirements

EHS Division management assigns staff personnel to review, interpret, and analyze proposed and final regulations, rules, and DOE directives. These reviews assess whether the potential requirements specifically apply to the work performed at LBNL and, if so, decide (1) whether compliance actions will have to be implemented Laboratory-wide or limited to only one or a few organizations, and (2) when they become effective through the ES&H Standards Change Management Process. Detailed considerations are made of the scope and use of potential

requirements, whether they have Institutional Scope and Broad Use, Specific Scope and Broad Use, or Specific Scope and Narrow Use (see Section 14.1 for definitions) to direct and use them properly. The potential impacts on Laboratory operations are also evaluated (e.g., the need for additional training, record keeping, reporting, new instrumentation systems, and modifications of existing facilities and operations).

The next step involves a review of the analysis of new requirements and impacts by Laboratory Director-appointed committees, particularly when institutional implementation of requirements is indicated and significant costs are associated with compliance. The organizations represented on these committees provide feedback to the ES&H professionals on programmatic and cost impacts and the practicability of proposed implementation actions.

In some situations, the impact of a requirement or standard is limited to a small group of individuals or a specific department. These limited-impact requirements may be handled directly by the affected organization through its subject matter experts.

12.2.3 Incorporation of Requirements

A variety of activities may be used to communicate new requirements once they have been determined. These include establishing a time line for implementation, and determining how the requirement will be added to the documentation base. This may result in a new policy or guidance document or a modification to existing documentation, such as a modification to the *ES&H Manual*.

The *ES&H Manual* is developed and revised to aid management in integrating requirements into Laboratory work activities. This manual either contains specific requirements or points to other documents containing the requirements applicable at LBNL. Generally, if the requirements are applicable to only a small subset of individuals at LBNL, or if the requirements are extensive and complex, the *ES&H Manual* will merely point back to the original requirements. In those situations when the *ES&H Manual* provides pointers, ES&H professionals will assist in the interpretation and implementation of the applicable requirements.

12.2.4 Requirements to Users

Individuals responsible for work activities are responsible for ensuring that the hazards and environmental impacts associated with the work are analyzed and controlled according to the *ES&H Manual*. Controls in the *ES&H Manual* or those identified by the ES&H professionals are to be implemented by those performing the work activities, unless an exemption from those controls has been appropriately approved. The Laboratory has a formal process for obtaining exemptions and variances described in Section 12.6.

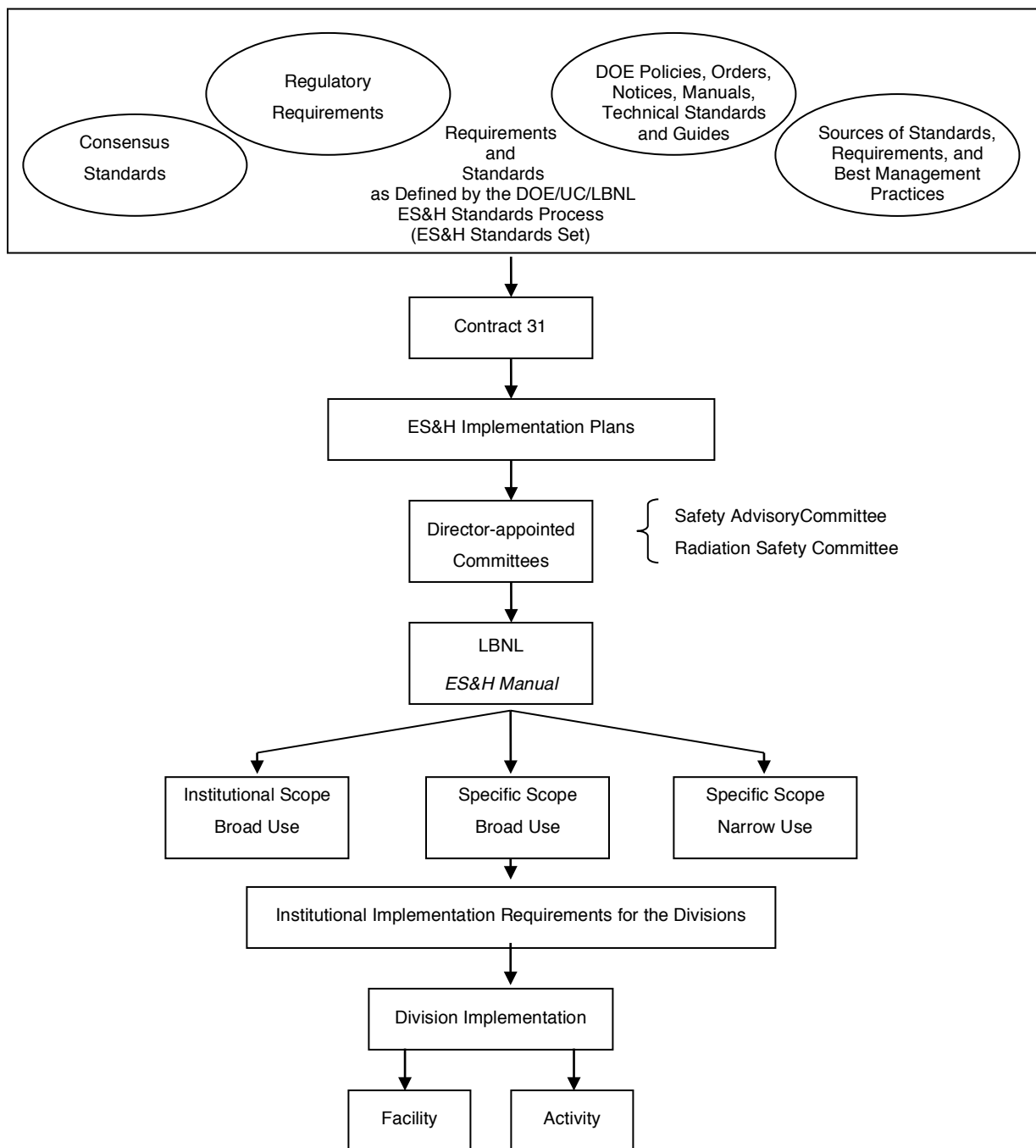


Figure 12.1 Information Flow-Down Process for the *ES&H Manual* and Implementation

12.3 Subcontractor ES&H Management

In Integrated Safety Management (ISM), the necessary focus of the subcontractor requirements is on the safety of the workers and the impact their actions have on the environment. Basic to all of the requirements are those in Contract 31, Clause I.79. In the LBNL ISMS, the core requirements for subcontractors are in Section 6.2.3. Application of these requirements, appropriate core requirements in Section 6, provisions of Section 7, and the *ES&H Manual* are necessary to meet the subcontractor ES&H management responsibilities.

The Procurement and Property Management Department (P&PM) is responsible for ensuring that ES&H requirements are included in the subcontractor operational process and procedures that control how subcontractors perform work for LBNL. The system to accomplish this must involve the organizations requesting the subcontract work and, as necessary, the appropriate EH&S Division subject matter experts (SMEs) and liaisons. All are critical elements of the system, and have their own particular responsibilities in a structured process defined in Section 6.2.3.4 of the ISMS. The system ensures that appropriate subcontract-ES&H requirements are included in contractual language that binds the subcontractor to maintain alignment with the established procurement practices. These ES&H requirements include the applicable ES&H clauses and standards.

The system includes the details of the Laboratory's oversight responsibilities for a subcontractor's ES&H management system in the subcontract language. It also ensures the flow-down of appropriate ES&H requirements, and ensures that subcontractors are evaluated and selected on the basis of historical ES&H performance and other relevant criteria. Additional information and elaboration are in the *ES&H Manual*, *SJHA Process*, *the Subcontractor Job Hazard Analysis* and the *P&PM Department Procedures*.

12.4 Procurement and Property Management

The procurement of goods and services is a key function to be addressed as part of ISM. This is accomplished in the LBNL ISMS through the use of a procurement ES&H management process that determines the hazards and environmental impacts of the goods and services to be procured, received, and delivered to the point of intended use. The process provides a determination of the hazards and environmental impacts for ordered goods and services that are hazardous, dangerous, or toxic. The planned use of these is addressed in the work-activity evaluation, documentation, and authorization process defined in Section 7.3 (i.e., a Job Hazard Analysis).

In the procurement ES&H management process, the requesting organization provides the procurement entity with the proper hazards and environmental-impacts determination so that the ES&H responsibilities can be fulfilled. This is consistent with the ES&H requirements in Contract 31, the applicable core requirements in Section 6, the provisions of Section 7, and the *ES&H Manual*. In the process, the organization requesting the goods and services evaluates and determines the hazards and environmental impacts of the goods and services being

ordered. The appropriate EHS Division SME and/or liaison assists in this process, as necessary. The resulting hazards and environmental-impacts determination is provided to the procurement entity along with the purchase request. P&PM maintains the necessary procedures for the conduct of this process. Additional information and elaboration are in the *ES&H Manual* and the *P&PM Procedures*.

12.5 Lessons Learned

Lessons Learned are shared to improve operational ES&H by benefiting from the experience of others. Lessons Learned are prepared and distributed whenever there is an opportunity to share a valuable new work practice or warn others of an adverse practice, experience, or product to prevent recurring issues and improve performance. The core requirements for Lessons Learned are defined in Section 6.7.1.6.

LBNL has an established Lessons Learned and Best Practices program in compliance with DOE Order 210.2A, DOE Corporate Operating Experience Program. Work practices, issues, or incidents that may have a significant impact on safety and operations are communicated to others via Lessons Learned / Best Practices Briefings. Lessons Learned from LBNL that may be applicable to other national laboratories are communicated across the Department of Energy (DOE) complex through the DOE Corporate Lessons Learned Database. Lessons Learned form an integral part of the Laboratory's ISMS and represent an important mechanism in accomplishing DOE Core Function No. 5—Provide Feedback and Continuous Improvement.

The institutional Lessons Learned Administrator (LLA) in the Office of Contractor Assurance supports the Laboratory in implementing, managing and overseeing the LBNL Lessons Learned and Best Practices program. In addition, briefings are maintained in and are available to LBNL personnel via the LBNL Lessons Learned/Best Practices Database. The effectiveness of lessons learned and best practices is evaluated on a periodic basis.

Divisions should encourage employees to bring to the attention of supervisors or division safety coordinators topics that could serve as possible Lessons Learned. Each division safety coordinator, in consideration of the core requirements, is responsible for:

- Ensuring distribution of Lessons Learned to appropriate LBNL personnel;
- Bringing to the attention of the SAC appropriate Lessons Learned in a timely manner;
- Identifying Lessons Learned that require follow-up action, and providing information to the Lessons Learned Administrator regarding what action has been taken;
- Identifying Lessons Learned from his or her division to be forwarded to the Lessons Learned Administrator.

12.6 Exemptions and Changes

The Laboratory has formal processes, described in the ES&H General Policy Section or the RPM, by which organizations and individuals can seek deviations, exemptions, variances, or waivers to institutional requirements contained or referenced in the *ES&H Manual*. Given valid justification, organizations and individuals can obtain a particular exception from established institutional requirements as long as equivalent or compensatory measures are in place to meet the requirements. The exception nomenclature, the necessary accommodations, and approval levels depend on the requirement specifics. This may require DOE or other governmental agency approval.

The *ES&H Manual* and other ES&H institutional documents can be changed at the discretion of the Laboratory as long as they remain consistent with the requirements in Contract 31 and this *Management Plan*.

Changes to existing ES&H policies and procedures or the generation of new ES&H policies may be proposed by a division, the ES&H staff, a Laboratory Director-appointed committee such as the SAC, or other senior managers. New ES&H policies or major changes to existing ES&H policies and procedures are recommended by the relevant SMEs or appropriate Laboratory Director-appointed committee to the EHS Division Director for approval.

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13.0 Definitions

13.1 Definitions

Assure	To verify that something was done.
Authorizing individual	The person designated by an authorizing organization who is responsible for a work activity's technical, financial, administrative, and ES&H objectives. Also, the individual authorized by a division director (or designee) to accept and manage, on the Laboratory's behalf, the risks associated with the work activity. This person authorizes the work to proceed only after all controls are implemented and confirmed.
Authorizing organization	The Laboratory organization (e.g., division or group) responsible for a work activity's performance. This includes ensuring adequate funding and determining work priorities.
Base skills	The skills, knowledge, and abilities (SKAs) necessary for a particular vocation and level.
Commonly performed by the public	An activity with hazards and environmental impacts commonly accepted, the control of which require little or no guidance or training in order to perform the work safely while minimizing environmental impacts.
Division	The set of organizational elements (e.g., departments, divisions, groups, programs, projects, offices) operating within the management responsibilities and authority of a division director
Ensure	To cause something to be done, either by doing it or by following up on assignments and delegations to verify that something was done. To guarantee a particular outcome. The Laboratory uses this term when referring to situations involving direct responsibility for activities, as in the case of the safety line manager.
Environmental aspect	An element of an organization's activities, products, or services that can interact with the environment.

Environmental Management System	A structured process to manage and control an organization's impact on the environment. It includes creation of an environmental policy that sets objectives and targets a program of implementation, effectiveness monitoring, problem correction, system review, and continual improvement. An environmental management system also identifies key resources and holders of responsibility for determining and implementing environmental policy, and communicating facets of the system to the entire organization.
ES&H professionals	The LBNL subject matter experts and members of the ES&H teams.
ES&H Standards Set	The set of standards that is necessary and sufficient to meet LBNL ES&H performance expectations and objectives. The ES&H Standards Set provides adequate protection for workers, the public, and the environment. All work performed at LBNL and the associated hazards must be covered by one or more of the standards in the ES&H Standards Set.
ES&H Standards subject matter expert	A designated LBNL employee with knowledge and expertise relevant to the work or one of the ES&H discipline areas who selects and works with the applicable ES&H Standards.
Facility	A building, group of buildings, or specific area of the Laboratory that is managed by a single responsible division director. May also be used to indicate a portion of a building, such as a laboratory or group of laboratories dedicated to a specific operation.
Graded approach	A method that provides for varying levels of rigor and formality when applying controls commensurate with the hazards and environmental impacts involved. This method ensures that the depth of detail required and the magnitude of resources expended for operations are commensurate with each facility's programmatic importance and potential environmental, safety, and health impact.
Hazard	A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to personnel or damage to a facility.

Implementation Plan	A documented plan describing how requirements and expectations will be accomplished. Following implementation at the division level, divisions may transition the <i>Implementation Plan</i> to other established division plans or documents (e.g., <i>ES&H Management Plans</i> , <i>ISM Management Plans</i> , and <i>QA Plans</i>) that satisfy the requirements specified in this <i>Management Plan</i> .
Institutional scope and broad use	Requirements that are general in scope and apply broadly to the Laboratory. Examples include general ES&H programs (e.g., industrial hygiene, industrial safety, health physics, and pollution prevention), training, and quality assurance. The requirements for hazards and environmental impacts frequently encountered at the Laboratory are generally specified in the PUB-3000.
Organization supervising work	An organization distinguished by having responsibility for supervising or watching over the performance of people involved in carrying out a work activity and ensuring that work requirements are met.
Home/Payroll Division Director	Division director who provides technical and specialty personnel to support program activities directly and by matrixing personnel to support the activities of other divisions. Responsible for the technical and specialty qualifications, basic job training, and administrative support. Also described as an administrative division director.
Program Division Director	Division director who provides program deliverables through control of and use of funding. Responsible for work authorization, technical deliverables, ES&H, business management, and staff work direction. Uses the funding for personnel, facilities, and services in own division and buys matrixed “payroll” personnel and other divisions’ facility capabilities, services functions, and products.

Safety	<p>The word “Safety” has previously been used to represent the DOE’s Policy 450.4 (<i>Safety Management System Policy</i>) and previously was used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment as defined in DOE P 450.4. Contract 31, Clause I.86, expanded the definition of ES&H by “including pollution prevention and waste minimization.” This <i>Management Plan</i> was revised to place additional emphasis on environmental management. When Safety is footnoted in this document as Safety⁽¹⁾, it is being cited per DOE P 450.4 and Clause I.86 of Contract 31. In all other cases, the use of the word “safety” represents safety in the traditional sense.</p>
Safety envelope	<p>The parameters defining the limits for the safe and environmentally responsible operation of a facility or operation. For example, the maximum amount of material, the maximum operating temperature, permit conditions related to a permitted activity (solvent degreaser), and the maximum pressure are boundary conditions that may specify portions of the ES&H envelope.</p>
Safety line management	<p>The unbroken linear safety management chain from the Laboratory Director to each worker. Above the lowest organizational unit in each division (e.g., first-line Human Resources (HR) supervisor), the chain is defined by the succession of direct reports that establish job assignments, appraise performance, and determine salaries. Below the first-line HR supervisor level, the chain can include workers at any level, and may include nonmanagement work leads who guide the day-to-day activities of one or more workers.</p>
Safety line manager	<p>A generic term for an individual directly responsible for an operation, activity, or group of activities. The safety line manager may be at any level within the organization and is formally identified by the activity’s authorizing individual. In some organizations, this person is called the work supervisor. In most cases, the safety line manager will be directing the work of others as part of the operation or activity. Examples of safety line managers are work lead, supervisor, manager, group leader, project leader, project engineer, and Principal Investigator. The safety line manager is not necessarily a worker’s Higher Education Employer-Employee Relations Act (HEERA) supervisor.</p>

Self-assessment	An assessment performed by the responsible organization to determine how well it is performing its jobs and meeting its responsibilities.
Self-assessment plan	A formal, management-approved document that describes a division's self-assessment activities and how often they occur, provides a schedule for completing the assessments, and identifies the reports to be generated.
Services division director	Division director who provides "fee for services" functions, facilities, and products. Responsible for work authorization, technical deliverables, ES&H, business management, and staff work directions.
Significant environmental aspect	An environmental aspect that has or can have a significant environmental impact; any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.
Specific scope and broad use	Requirements that are relatively specific in scope and apply broadly to the Laboratory. Examples include emergency preparedness, fire protection, and engineering standards. For example, some engineering design standards may pass through directly to the engineers without manuals, guides, etc., to assist the engineers other than the stated recognition that the (design) standards are to be used.
Specific scope and narrow use	Requirements that are relatively specific in scope and apply to a limited set of staff, groups, or activities. Examples include firearms and personnel assurances.
Subject matter expert (SME)	An LBNL employee who is a recognized authority in a particular field. This might include a person from ES&H Division, Facilities Division, Engineering, Computations, etc.
Tailored controls	Engineered and administrative controls, as well as personal protective equipment, selected from the ES&H Standards and LBNL's PUB-3000 and designed to fit a particular work activity. Properly tailored controls will address hazards and environmental impacts, satisfy the applicable requirements, and provide adequate protection to the public, workers, and the environment.

Tailoring	Adapting something—such as a control, safety program, practice, or requirement within the ISMS—to suit the need or purposes of a particular operation or activity, taking into account the type of work and associated hazards and environmental impacts.
Work lead	A person authorized by line management to direct, train and/or oversee the work and activities of one or more workers. Work leads provide instruction on working safely and the precautions necessary to use equipment and facilities safely and effectively. Work leads need not be line managers, HEERA-designated supervisors, or LBNL employees. Work leads are often worker peers, postdoctoral students, or graduate students. All work leads are safety line managers.
Work review	A review of the integrated set of ES&H controls, resources, and schedules; usually conducted before beginning a work activity.

14.0 References

1. DOE Order 450.1A, *Environmental Protection Program*.
2. Department of Energy (DOE) Prime Contract DE-AC02-05CH11231 (Contract 31), June 1, 2005, with approved modifications.
3. DOE P 450.4, *Safety Management System Policy*, October 15, 1996, canceled by Reference 4.
4. DOE P 450.4A, *Integrated Safety Management Policy*, April 25, 2011
5. DOE G 450.4-1C, *Integrated Safety Management System Guide*, Sep 29, 2011.
6. Partnership Agreement between UCB and LBNL Concerning Environment, Health and Safety Policy and Procedures.
http://www.lbl.gov/ehs/ism/ucb_lbl_partnership_3_15_04.pdf

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APPENDIX A

Division ES&H Plan Checklist

Division:		Plan version/source:	
		Date:	
Institutional ISM Plan Section:	Description of Division ISM Implementation Plan Requirement	Addressed? y/n	Comments: Describe where requirement is met, or why omitted.
1.0	Purpose		
2.0	Description of Division/ Department Organization, Mission, and Scope of Work		
3.0	ES&H Roles, Responsibilities and Accountability		
3.01	Division Leadership Responsibilities		
3.02	Supervisor/PI Responsibilities (e.g., group leaders and formal supervisors as appropriate)		
3.03	Work Leads		
3.04	Staff/Worker Responsibilities		
3.05	Subcontracted Work and Staff		
3.06	Matrixed Employees		
3.07	Student Safety		
3.08	Division Safety Coordinator		
3.09	Safety Review Committee Member		
3.10	Building Manager Responsibilities		
3.11	Work at UC Berkeley Campus		
3.12	Offsite Work		
3.13	Telecommuting		
4.0	Division ES&H (Safety) Committee		
5.0	Scope of Work Authorized		
5.01	Work Locations, Facilities, and Work Location Hazards (e.g., HMS System)		
5.02	Work Requiring Specific Authorization (e.g., list group JHAs, point to system)		
6.0	Performance Monitoring and Feedback		
6.01	Self-assessment Process		
6.02	Division Walk-around Inspection Process & Schedule		
6.03	Injury & Illness Reporting, Tracking and Analysis		
6.04	CATS Tracking of Deficiencies		
6.05	Mishap Investigation (e.g., ORPS, SAARs)		
6.06	Near Hits (Precursors) Discussion and Lessons Learned		
6.07	Working Alone		
7.0	Qualification and Training		
7.01	Supervisor Training		
7.02	Work Lead Training		
7.03	Employee/Worker Training		
7.04	Medical Surveillance		
8.0	Emergency Preparedness		
9.0	Reporting Employee Concerns		
10.0	Balanced Resources		

Division ISM *Implementation Plans* must address each of the elements in the above table that are applicable to their division. Division ISM plans are reviewed annually by the EH&S Division to identify required and recommended topic areas. This checklist was developed based on requirements in this Institutional ISM Plan, PUB-3000, and input from division safety

coordinators. Use of the checklist is described in Section 8.2, *Division-Specific Documents*. An electronic version of this checklist can be accessed at:

http://www.lbl.gov/ehs/ism/assets/docs/ISM_Division_Plan_Checklist.doc

Prior to Revision 7 of the Institutional ISM Plan, a more prescriptive Division ES&H Plan (Sample Template) was provided for divisions to develop their implementation plans. During the FY 2008 and FY 2009 ISM review cycle, that template was replaced by the checklist provided above.

Appendix B

Acronyms

AHD	Activity Hazard Document
ALD	Associate Laboratory Director
ALDO	Associate Laboratory Director for Operations
ANSI	American National Standards Institute
ASE	Accelerator Safety Envelope
BNL	Brookhaven National Laboratory
BSO	Berkeley Site Office
BUA	Biological Use Authorization
CATS	Corrective Action Tracking System
CDC	Centers for Disease Control
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHSP	Chemical Hygiene and Safety Plan
CMP	Change Management Process
CO	Contracting Officer
COO	Chief Operating Officer

CRD	Contractor Requirements Document
DART	days away, restricted, transferred
DEAR	Department of Energy Acquisition Regulation
DOE	United States Department of Energy
DOE SC	Department of Energy Office of Science
DSC	Division Safety Coordinator
EHS	Environment, Health, Safety, Security (Division)
EIR	Employee Institutional Requirements
ES&H	Environment, Safety, and Health (subject and policy)
EMS	Environmental Management System
ESG	Environmental Services Group
G&A	General and Administrative
HEAR	Hazards, Equipment, and Authorizations Review
HEERA	Higher Education Employer-Employee Relations Act
HWHF	Hazardous Waste Handling Facility
IBA	Institutional Budget Activity
IBC	Institutional Biosafety Committee
IHA	Integrated Hazard Assessment

IMP	Issues Management Program
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
JBEI	Joint BioEnergy Institute
JGI	Joint Genome Institute
JHA	Job Hazard Analysis
JHQ	Job Hazard Questionnaire
LBNL	Lawrence Berkeley National Laboratory
LLA	Lessons Learned Administrator
MESH	Management of Environment, Safety, and Health
N&S	Necessary & Sufficient
NEPA	National Environmental Policy Act
NERSC	National Energy Research Scientific Computing Center
NIH	National Institutes of Health
OBA	Office of Biotechnology Activities (NIH)
OCA	Office of Contractor Assurance
OSHA	Occupational Safety and Health Administration
P&PM	Procurement and Property Management Department

PEMP Performance Evaluation and Measurement Plan

PI Principal Investigator

PRD Performance Review Document

PUB-3000 Publication 3000 (LBNL ES&H Policy Manual)

QA quality assurance

RCM Radiological Control Manager

RPG Radiation Protection Group

RPM Regulations and Procedures Manual

RPP Radiation Protection Program

RRA Roles, Responsibilities, and Authorities

RSC Radiation Safety Committee

RWA Radiological Work Authorization

SAAR Supervisor Accident Analysis Reporting

SAC Safety Advisory Committee

SKA skill, knowledge, and ability

SME subject matter expert

TABL Today at Berkeley Lab

TPL Technical Program Lead

TS	Technical Services
UC	University of California
UCOP	University of California Office of the President
WMG	Waste Management Group
WHR	Work and Hazard Review
WSHP	Worker Safety and Health Program

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